An assessment of the comprehension of the preliminary 2007 version of the South African paediatric food-based dietary guidelines for Northern Sotho infants 6–12 months of age in Soshanguve and Ga-Rankuwa.

by
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Thesis presented in partial fulfilment of the requirements for the degree of Master of Nutrition at the University of Stellenbosch

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ABSTRACT

Introduction

Malnutrition, in both adults and children, is a problem worldwide with negative health consequences. The World Health Organization (WHO) and Food and Agricultural Organization (FAO) of the United Nations (UN) therefore initiated the implementation of country-specific food-based dietary guidelines (FBDGs) to be used as an educational tool to address nutrition-related health issues. They further suggested consumer testing to evaluate the comprehension and cultural acceptability thereof prior to the release of country-specific FBDGs. Focus group discussions (FGDs) were recommended for consumer testing.

Aim

The aim of this study was to assess the comprehension and applicability of the 2007 version of the preliminary South African paediatric food-based dietary guidelines (PFBDGs) for healthy infants aged 6–12 months in Soshanguve and Ga-Rankuwa. Specific objectives included qualitative evaluation of exposure to preliminary PFBDGs, participants' interpretation thereof, cultural acceptability and practical application of the guidelines. Socio-demographic information was collected to determine whether these factors could potentially exert an influence on the comprehension and applicability of the FBDGs. This study could further inform emerging efforts to update public health initiatives to educate mothers/caregivers of infants.

Methodology

An observational, cross-sectional study design was followed, incorporating both qualitative and quantitative research methods. FGDs were utilised to assess comprehension of the PFBDGs and gather insight into perceptions, attitudes and appropriateness of the PFBDGs. Quantitative data were collected by means of a questionnaire regarding the socio-demographic profiles of participants.

Setting

This study focused on two small, densely populated towns, Soshanguve and Ga-Rankuwa, in the north western district of Tshwane in the Gauteng province of South Africa. The areas represent relatively low socio-economic communities that include a mix of formal and informal urban settings.

Participants

Twenty-seven Northern Sotho-speaking mothers and caregivers of infants aged 6–12 months participated in a total of six FGDs. Each FGD was attended by between three and six participants.

Results

None of the participants had previous exposure to the PFBDGs, although they were familiar with most of the concepts. Guidelines were generally well received and understood, but a few were misinterpreted; particularly those pertaining to “enjoy time with your baby”, “increase your baby’s meals to five times per day” and “teach your baby to drink from a cup”. These needed further explanation and rephrasing by the investigator to improve their comprehensibility. The guideline pertaining to breastfeeding was the most familiar, well accepted and most generally applied.

Quantitative results indicated no significant difference between the socio-demographic profiles of participants in Soshanguve and Ga-Rankuwa. Participants’ education level, employment status and housing conditions were considered a good representation of the population. It appears that socio-demographic circumstances may affect exposure to, and interpretation and application of the PFBDGs.

Conclusion

Many of the adjustments recommended from this research is consistent with the changes incorporated in the recently published revised PFBDGs. Supportive documentation, educational material and health campaigns tailored to specific socio-demographic groups may further enhance the interpretation of the revised guidelines and their exposure to the public, once tested and adopted.

OPSOMMING

Inleiding

Wanvoeding onder kinders en volwassenes, is ’n wêreldwye probleem wat, as dit nie aangespreek word nie, ernstige gesondheidsgevolge kan inhou. Die Wêreldgesondheidsorganisasie (WGO) en die Voedsel-en-landbou-organisasie (VLO) het die implementering van voedselgebaseerde dieetriglyne (VGDR) spesifiek aan elke land geïnisieer sodat dit as opleidingshulpmiddel kan dien om voedselverwante gesondheidsprobleme op te los. Daar is voorgestel dat verbruikers die riglyne in fokusgroepbesprekings (FGBs) evalueer om begrip en die kulturele toepaslikheid van bevolking-spesifieke riglyne te toets voordat dit bekendgestel word.

Doel

Die doel van die studie was om begrip en die toepassing van die 2007 weergawe van die voorlopige Suid-Afrikaanse pediatriese voedselgebaseerde dieetriglyne (PVGDR) vir gesonde kinders van 6–12 maande te bepaal. Spesifieke doelwitte het kwalitatiewe evaluering ten opsigte van blootstelling, deelnemers se interpretasie, kulturele aanvaarbaarheid en praktiese toepassing van die riglyne ingesluit. Sosiodemografiese inligting is ingesamel om te bepaal of daar ’n verband bestaan tussen hierdie omstandighede en die begrip en toepassing van PVGDR’s. Hierdie studie kan toekomstige pogings ondersteun om openbare-gesondheidsprogramme by te werk en om moeders en versorgers oor babas in te lig.

Ontwerp

Die studieontwerp was ’n waarnemende deursnit met kwalitatiewe en kwantitatiewe navorsingsmetodes. FGBs was gebruik om die begrip van die PVGDR’s te bepaal en insigte oor die persepsies, houdings en geskiktheid van die PVGDR’s in te samel. Kwantitatiewe data is ingesamel met ’n vraelys oor die sosiodemografiese profiele van deelnemers.

Omgewing

Die studie het gefokus op twee klein, digbevolkte stedelike gebiede, Soshanguve en Ga-Rankuwa in Tshwane, die noord-westelike distrik van die provinsie Gauteng in Suid-Afrika. Die areas verteenwoordig relatief lae sosio-ekonomiese gemeenskappe met ’n mengsel van formele en informele stedelike nedersettings.

Deelnemers

Die studiegroep het 27 Noord-Sotho-sprekende moeders en versorgers ingesluit wat aan altesaam 6 FGB's deelgeneem het. Tussen drie en ses deelnemers het elke FGB bygewoon.

Resultate

Geen deelnemers was voorheen aan PVGDR's blootgestel nie, hoewel die meerderheid met meeste van die begrippe bekend was. Die riglyne was oor die algemeen goed aanvaar en verstaanbaar, maar 'n paar was verkeerd geïnterpreteer; veral "geniet tyd saam met jou baba", "vermeerder jou baba se maaltye na vyf kere per dag" en "leer jou baba om uit 'n koppie te drink". Verduideliking en herformulering was nodig om begrip te verbeter. Die riglyne oor borsvoeding was die bekendste, was die beste aanvaar en was in die algemeen toegepas.

Kwantitatiewe resultate het aangedui dat die sosiodemografiese profiel van deelnemers uit Soshanguve en dié uit Ga-Rankuwa nie beduidend verskil nie. Deelnemers se opleidingsvlak, werkloosheidstatus en huislike omstandighede het die populasie goed verteenwoordig. Daar is bevind dat sosiodemografiese omstandighede blootstelling aan en begrip en toepassing van PVGDR's kan beïnvloed.

Gevolgtrekking

Baie van die wysigings wat voorgestel is deur hierdie studie, stem ooreen met die verandering wat aangebring is in die onlangs gepubliseerde hersiene PVGDR's. Ondersteunende dokumente, opvoedkundige materiaal en gesondheidsveldtogte vir spesifieke sosiodemografiese groepe sal die korrekte interpretasie van riglyne asook openbare bewusmaking bevorder. Die riglyne kan, met minimale aanpassings, suksesvol as 'n voedingsverwante opvoedkundige hulpmiddel in die gemeenskap gebruik word. Baie van hierdie aanpassings is reeds aangebring tydens die ontwikkeling van die veranderde PVGDR's. Die bevindinge van die studie kan 'n kernbydrae tot die voorstelle lewer, en aanduidings vir voorstelle vir verdere ontwikkeling en evaluering oplewer.

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CONTRIBUTIONS BY PRINCIPAL RESEARCHER AND FELLOW RESEARCHERS

The principal researcher (Adeline Pretorius):

- Developed the protocol
- Planned the research project
- Undertook data collection
- Captured the data for analysis
- Transcribed and analysed the qualitative data
- Analysed the quantitative data with the assistance of a statistician (Prof DG Nel)
- Interpreted the data
- Compiled the thesis

The supervisor (Prof LT Bourne) and co-supervisor (Mrs N Koen) provided guidance and input at all stages, and revised the protocol and the thesis.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

Afrikaans

FGBs	Fokusgroepbesprekings
PVGDR	Pediatriese voedselgebaseerde dieetriglyne
VGDR	Voedselgebaseerde dieetriglyne
VLO	Voedsel-en-landbou-organisasie
WGO	Wêreldgesondheidsorganisasie

English

BFHI	Baby-Friendly Hospital Initiative
CHC	Community health centre
DOH	Department of Health
EBF	Exclusive breastfeeding
FAO	Food and Agricultural Organization
FBDGs	Food-based dietary guidelines
FGDs	Focus group discussions
GMP	Growth monitoring and promotion
HSRC	Human Sciences Research Council
IMCI	Integrated Management of Childhood Illness
INP	Integrated Nutrition Programme
MBFI	Mother Baby Friendly Initiative
MDGs	Millennium Development Goals
MRC	Medical Research Council
NCDs	Noncommunicable diseases
NFCS	National Food Consumption Survey
NSSA	Nutrition Society of South Africa
OECD	Organisation for Economic Cooperation and Development
PFBDGs	Paediatric Food-Based Dietary Guidelines
PHC	Primary health care
PHS	Public health service(s)
RDIs	Recommended dietary intakes
RtHB	Road to Health booklet
RtHC	Road to Health card

SAIYCF	South African Infant and Young Child Feeding
SAM	Severe acute malnutrition
SANHANES	South African National Health and Nutrition Examination Survey
SAVACG	South African Vitamin A Consultative Group
SD	Standard deviation
TB	Tuberculosis
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

CHAPTER 1

LITERATURE REVIEW AND MOTIVATION FOR THE STUDY

1.1 INTRODUCTION

Despite the considerable progress made in recent decades, the world still falls short of the goal of adequate food and nutrition for all. Over 800 million people, mainly in Africa, South Asia and Latin America, do not have enough food to meet their basic daily needs for energy and protein. More than two billion people survive on diets that lack the essential vitamins and minerals required for normal growth and development. Concurrently, millions suffer from diseases caused by excessive or unbalanced dietary intakes or by the consumption of unsafe food and water.[1,2]

Eliminating hunger and malnutrition are within the reach of modern human society. Well-conceived policies and actions at national and international levels can have a dramatic impact on these nutrition problems.[1] At the Millennium Summit in 2000, one of the world's largest gatherings of leaders, the United Nation's Millennium Declaration was adopted, committing nations to a global partnership in setting targets to reduce poverty and its consequences by 2015. Subsequently, the Millennium Development Goals (MDGs) were developed as the world's time-bound and quantified targets for addressing extreme poverty in its many dimensions, including inadequate income, hunger, disease, lack of adequate shelter and exclusion.[3] Many countries, including some of the poorest, have successfully adopted and taken measures to implement programmes to reduce hunger and malnutrition. As a result, the total number of undernourished people in the world has declined in the past decades and developing countries as a whole have registered significant progress towards the MDGs hunger target. However, considerable and immediate additional efforts are still required to reach the target levels.[2]

In South Africa, a review of progress towards the MDGs undertaken in 2009, showed that the country has moved forward in achieving some of these goals, but progress has been inadequate. Unfortunately, however, for some goals the progress has been reversed, specifically for the MDGs related to eradicating hunger and poverty, and reducing mortality for children under the age of 5 years. Moreover, South Africa is one of only 12 countries in which childhood mortality has increased since the development of the MDGs in 1990.[4,5]

In the World Declaration and Plan of Action for Nutrition of 1992 it was recognised that the development of national action plans specific to each cultural context was required to improve the nutrition situation worldwide.[1] At the International Conference on Nutrition in Rome in 1992, the World Health Organization (WHO) and the Food and Agricultural Organization (FAO) convened an expert consultation. The aim was to identify and encourage the development of strategies that can be applied globally to improve food consumption and consequently nutritional status.[6] They adopted the World Declaration and Plan of Action for Nutrition[1] to eliminate and reduce all forms of malnutrition worldwide. It was recognised, among other, that existing nutrient-based guidelines were difficult for the general population to understand and interpret, and were not necessarily culturally appropriate. The WHO/FAO committee therefore concluded that food-based dietary guidelines (FBDGs) specific to each country would be more appropriate to address local nutrition-related public health issues. Subsequently, a joint WHO/FAO Expert Consultation was convened in 1995, in Cyprus, on the Preparation and Use of Food-based Dietary Guidelines. The aim was to establish the scientific basis for developing and using FBDGs to improve food consumption patterns and nutritional well-being of individuals and populations. The FBDGs were required to be scientifically sound, evidence based, yet comprehensible, as well as providing practical guidelines for the general population. Furthermore, it was specified that recommended foods needed to be available and affordable, culturally appropriate, and that the statements generated needed to be phrased in positive language.[6] The FBDGs therefore became part of the WHO/FAO's strategy to promote appropriate diets through the recommendation of healthy dietary habits and lifestyles in order to prevent nutrient deficiencies and the development of nutrition-related noncommunicable diseases (NCDs)[1]. Although the supporting science and methodology for developing country-specific FBDGs has been documented, many countries still lack the capacity of translating scientific evidence into FBDGs or appropriate education tools. South Africa is one of the few countries that have chosen to follow and document these recommendations that were put forward more than a decade ago.[7]

The WHO/FAO committee recommended the formation of local working groups for the development of country-specific FBDGs, whilst considering local public health issues.[6] In 1997, a working group was established in South Africa to develop South African FBDGs

[1] *Noncommunicable diseases (NCDs), also known as chronic diseases, are not passed from person to person. They are of long duration and generally of slow progression. The four main types of noncommunicable diseases are cardiovascular diseases (such as heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes.*[8]

for adults and children above the age of 5 years without special clinical dietary needs. During 1999 and 2000, following an extensive literature review and discussions, 11 guidelines were developed and tested across a wide spectrum of social and cultural groups. The process of refining and adapting the guidelines continued until a final set of FBDGs for healthy South Africans aged 7 years and older was approved and adopted by the Department of Health (DOH) in 2003.[9,10]

Alongside the development of the above set of FBDGs, it was recognised that these guidelines should be adapted for groups with special dietary needs, including people living with HIV and AIDS, children under 7 years (i.e. before school-going age), the elderly, as well as pregnant and lactating women. Consequently, additional working groups were initiated in 2000 to develop FBDGs for the specific priority groups.[9,10]

The WHO/FAO panel further suggested that field testing should be performed among the general public, prior to the release of FBDGs, to ensure that they were practical, comprehensible and acceptable in addressing the general population.[6] In South Africa, previous studies have been undertaken to test the comprehensibility, cultural acceptability and practical application of the 2007 version of the preliminary paediatric food-based dietary guidelines (PFBDGs) for the different age categories.[11–13] These studies were performed mainly in the Western Cape Province in Afrikaans-, English- and Xhosa-speaking mother/caregiver groups. The overall aim of the WHO/FAO FBDGs is to develop clear and simple nutritional guidelines, incorporating social and cultural preferences.[6] The South African population is extremely diverse, and extensive assessments of the comprehension of FBDGs of different language, cultural and social groups are needed to ensure they are applicable to all South Africans.

The aim of this study was to assess the comprehension of the 2007 version of the preliminary South African PFBDGs[10] for infants aged 6–12 months in a cultural group that had not yet been assessed. Northern Sotho is one of the most commonly spoken home languages in South Africa and the study therefore included the Northern Sotho community in Soshanguve and Ga-Rankuwa, situated in the north of Gauteng.

During the development of the study protocol, the 2007 version of the PFBDGs were under review. However due to time and financial constraints, it was decided to continue with the

testing of the 2007 PFBDGs. The study results could be used to evaluate the new revised PFBDGs and serve as a guide to inform the future assessments.

1.2 MALNUTRITION AND WORLD HUNGER

The FAO's most recent estimates indicate that globally 868 million people, about 12% of the world population, are unable to meet their dietary energy requirements.[2] Thus, about one in eight people in the world are likely to suffer from chronic hunger and do not have enough food for an active and healthy life. The vast majority of hungry people, around 827 million, live in developing regions, where the prevalence of undernourishment (inadequacy of dietary energy supply and micronutrient intake) is estimated to be 14.3%. Most of the world's undernourished people are in Southern Asia, closely followed by Sub-Saharan Africa (see Figure 1.1). Africa remains the region with the highest prevalence of undernourishment, with more than one in five people estimated to be undernourished. While Sub-Saharan Africa has the highest level of undernourishment, there has been some improvement over the last two decades, with the prevalence of undernourishment declining from 32,7% to 24,8%. Although the estimated number of undernourished people is decreasing globally, the rate of progress appears insufficient to reach international goals for hunger reduction in developing regions, especially on the African continent.[2]

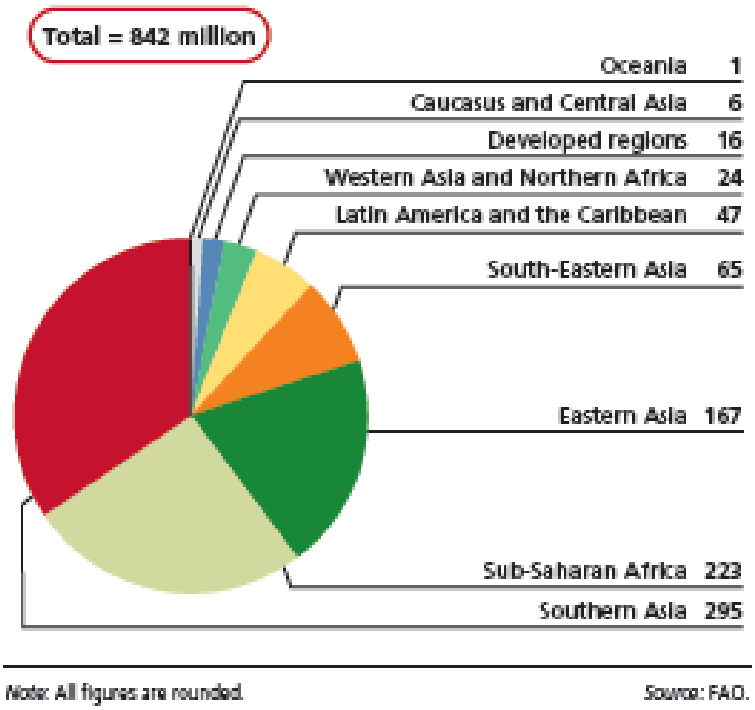

Figure 1.1: Global undernourishment in 2011–2013[2]

Moreover, undernourishment during childhood continues to be a prevalent and damaging condition in many countries. Undernourishment amongst children younger than five years, encompassing stunting (low height-for-age), undernutrition (low weight-for-age) and wasting (low weight-for-height), as well as deficiencies of essential vitamins and minerals (micronutrient deficiencies) remains a major public health problem, especially in middle- and low-income countries, and continues to hamper children's physical growth and mental development. Undernutrition is a major threat to their survival and future socio-economic status.[14,15]

In an article in a WHO Bulletin (2000),[16] stunting figures were used to analyse changes in levels of child malnutrition in developing countries since 1980. Stunting was used as an indicator because it best reflects long-term cumulative effects resulting from inadequate diet and/or recurrent illness. Results indicated that child malnutrition has fallen progressively from 47% in 1980 to about 33% in 2000. Despite population growth, the estimated number of stunted children under 5 years has decreased by almost 40 million in these countries during these years. However, the data presented confirm that child malnutrition remains a major public health problem in developing countries, where a third of all children under 5 years old suffer from stunted growth. Seventy percent of them live in Asia, 26% live in Africa, and about 4% live in Latin America and the Caribbean. Although stunting is decreasing globally, in some countries the rates of stunting are rising and in many others they remain disturbingly high (see Figure 1.2).

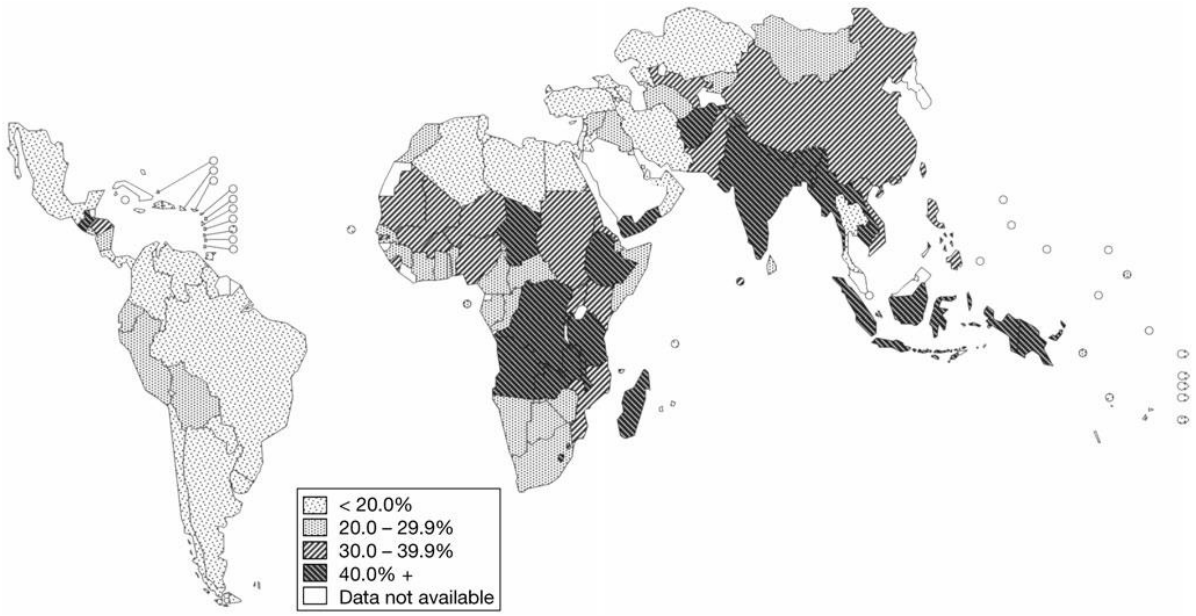

Figure 1.2: Prevalence of stunted children in developing countries[15]

More recent recent figures from 2011[14] confirmed a further reduction in the prevalence of undernutrition. Globally, 165 million children younger than 5 years were stunted. The prevalence decreased from an estimated 40% in 1990, to an estimated 26% in 2011 – an average reduction of 2.1% per year. Although the largest reduction in stunting since 1985 have been in Asia, the highest prevalence still remained in this region with 69 million children affected, followed by east Africa and west Africa. Additionally, more than 100 million children younger than 5 years (16%) were underweight in 2011, a 36% decrease from 1990 and 52 million were wasted, an 11% decrease from 1990. While progress has been made globally in reducing childhood undernutrition, figures remain high, attributing to an estimated 3.1 million child deaths annually.

Conversely, at the other extreme of the malnutrition spectrum, findings from the WHO Global Database on Child Growth and Malnutrition[15] demonstrate that overweight is becoming a matter of growing concern. Worldwide, the prevalence of childhood overweight and obesity has increased over recent decades (see Figure 1.3). According to the publication by Black et al[14] in 2011, globally, an estimated 43 million children younger than 5 years (7%) were overweight, a 54% increase from the estimated 28 million in 1990. This trend is expected to continue and reach a prevalence of 9.9% in 2025. Although the prevalence of childhood overweight is higher in high-income countries (15%), an increase in the trends of overweight is observed in most world regions. In Africa, the estimated prevalence increased from 4% in 1990 to 7% in 2011 and expected to reach 11% in 2025. In Asia, the prevalence is lower (5%), but the number of children affected are higher than in Africa (17 and 12 million respectively).

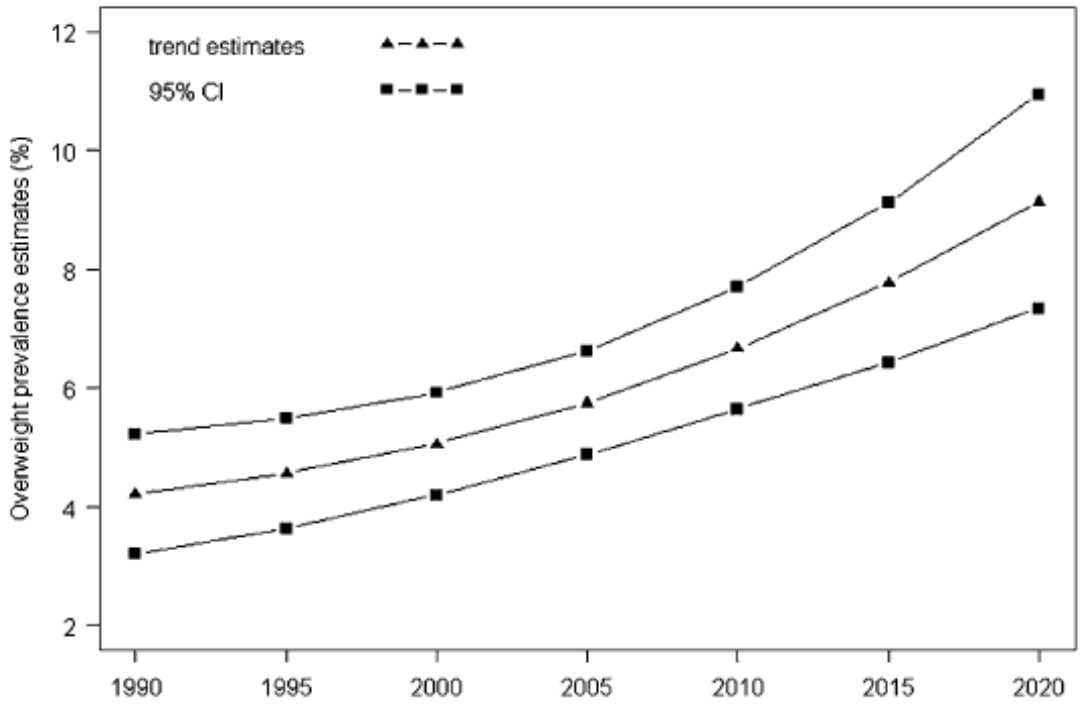

Figure 1.3: Global prevalence and trends of overweight and obesity among preschool children[17]

Childhood overweight and obesity are associated with a range of health-related complications that could increase the risk of premature illness and death later in life.[18] The above findings confirm the importance of monitoring worldwide levels of overweight during childhood and emphasise the need for effective interventions starting prenatally and in early childhood to reverse the trends.

1.3 CONSEQUENCES OF MALNUTRITION

1.3.1 Childhood undernutrition and health consequences

Undernutrition continues to be one of the major causes of morbidity and mortality amongst children in developing countries. Undernutrition is caused by inadequate nutritional intake that can arise when food is unavailable or taken in insufficient amounts. The diets of people in developing countries are frequently deficient in macro- and micronutrients, leading to protein-energy malnutrition and/or micronutrient deficiencies. Undernutrition increases one's susceptibility to disease and affects the severity of infection. It is therefore a major determinant of illness and death from disease. Although poverty is the main

underlying cause of undernutrition in developing countries, the high prevalence of infectious[2] and parasitic[3] diseases, such as malaria, measles or hookworms, and the increasing number of people infected with HIV or AIDS contribute greatly to this condition.[14,19]

Parasitic infections commonly occur when poverty leads to poor housing conditions, low levels of education, poor access to health services with inadequate sanitation and lack of clean water. Parasitic disease is considered a major contributor to undernutrition, as it may cause reduced growth rates during childhood and impaired nutrient utilisation leading to micronutrient deficiencies. Furthermore, an individual's immune response to intestinal parasites may favour the progression of underlying tuberculosis (TB) and HIV/AIDS, increasing the risk of serious illness and mortality, especially amongst children and women.[20,21]

The term 'hunger', describing a feeling of discomfort due to insufficient food intake, is also often used to describe undernutrition, especially with reference to food insecurity and poverty with a lack of affordability and availability of nutritious food. Many global strategies focus on the reduction of world hunger to improve nutritional well-being and food consumption throughout the world.[2,14] One indicator used to monitor progress of these actions includes the proportion of children who are undernourished. Nutrition during the early years of life is a major determinant of growth and development, and greatly influences adult health.[22] Anthropometric indices commonly used to assess the nutritional status of children include weight-for-age, weight-for-height and height-for-age. Children categorised as being 'underweight' present with a low weight compared to what is expected for a well-nourished child of the same age and gender. Although this could be used to monitor growth and quickly identify malnutrition, it is less sensitive in determining the duration of malnutrition. The latter two indices are often preferred, since they can be used to discriminate between acute and chronic undernutrition. A low weight-for-height, can indicate wasting, suggesting acute weight loss, and a low height-for-age can indicate

[2] *Infectious diseases are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi. The diseases can be spread, directly or indirectly, from one person to another such as malaria, TB and measles.*[8]

[3] *A parasitic disease is an infectious disease caused or transmitted by a parasite. It can affect practically all living organisms, including plants and mammals. Parasites receive nourishment and protection while disrupting their hosts' nutrient absorption, causing weakness and disease. Those that live inside the digestive tract are called intestinal parasites.*[8]

stunting and a chronic restriction of a child's potential growth.[15,19] The WHO expresses these indices in terms of a Z-score to enable the comparison of children with a reference population. With accurate anthropometric measurements, the standard deviation (SD) of the Z-score distribution should be constant; it is expected to be close to 1.0. A score of < -2.0 SD for weight-for-age, weight-for-height and height-for-age indicates moderate undernutrition, while a Z-score of < -3.0 SD indicates severe undernutrition.[15]

Micronutrient deficiencies are another possible manifestation of malnutrition, often called the 'hidden hunger'. Vulnerable groups who are more likely to suffer from micronutrient deficiencies include young children, women of reproductive age and the elderly. The number of people affected by micronutrient deficiency is estimated to be over two billion, which is even higher than those suffering from energy deficiency.[23,24] Micronutrient deficiencies can exist in populations even where the food supply is adequate in terms of meeting energy requirements. In these situations, people may not be considered 'hungry' or present as being malnourished, but their diets may be deficient in one or more micronutrients. Although the consequences of these subclinical deficiencies are becoming better understood and monitored, they often go unnoticed within the community in spite of their detrimental effects on immune system functioning, growth and cognitive development. It is for these reasons that micronutrient deficiencies have been referred to as 'hidden hunger'.[24]

Micronutrient deficiencies are most prevalent in areas where the diet lacks variety, as is the case for many individuals living in developing countries. These people cannot afford to diversify their diets with adequate amounts of fruits, vegetables or animal-source foods, which are sources of vital micronutrients, and therefore deficiencies are inevitable. In addition, a minimum amount of fat or vegetable oil is required in the diet for adequate absorption of the fat-soluble vitamins A, D, E and K. Grave consequences, including continued and sustained loss of productivity, permanent mental disability, blindness, depressed immune system function, and increased infant and maternal mortality can result from micronutrient deficiencies.[24]

Iron, vitamin A and iodine deficiencies are the three micronutrient deficiencies of greatest public health significance in the developing world. Vitamin B, C and D deficiencies have declined over the past decades and, although deficiencies may occur occasionally, they receive lower priority on a public health level. Global attention to zinc deficiency has

increased significantly over the past decade. Although there is still little information available about the prevalence of this deficiency, it is assumed to be widespread in areas lacking dietary diversity.[19,23,24]

Iron deficiency is the most prevalent nutritional deficiency worldwide. It may lead to anaemia and several other adverse effects, increasing the risk of morbidity and mortality. It is a frequent cause of psychomotor disorders, poor coordination and decreased physical activity. Nutritional iron deficiency, or poor food intake combined with elevated needs, are the most common causes of iron deficiency. An individual's iron requirements are increased during periods of growth in childhood and during pregnancy, or when iron is lost because of parasitic infections such as hookworms or malaria.[19,23-25]

Vitamin A is essential for normal growth and tissue repair. It affects mainly the functioning of the eyes and immune system. Vitamin A deficiency leading to an impaired immune function has been linked to increased childhood illness and death. Improving the vitamin A status of children may drastically decrease child mortality and death caused by measles and diarrhoeal infections.[24,25]

Iodine is an essential mineral needed for the production of thyroid hormones. Thyroid hormones assist with the control of many bodily functions, including brain functioning and development, growth in children and body-temperature control.[19,24,25] Iodine deficiency affects around 740 million people worldwide, with the majority presenting with enlarged goitre, and about 20 million with brain damage due to maternal iodine deficiency during foetal development.[19] Iodine deficiency is one of the most preventable disorders. It is effectively controlled with food fortification, by adding small amounts of iodine to frequently consumed foods such as table salt.[24]

Zinc is essential for the functioning of many enzymes and is involved in many metabolic processes such as growth and wound healing, and in the immune system. Rapidly growing children and pregnant and lactating women have the highest zinc requirements. This group, and the elderly, are often at risk of developing this deficiency.[19,25] Zinc deficiency is usually caused by a generally poor diet and people who present with zinc deficiency, usually lacks calories and other nutrients at the same time. For this reason, children who are chronically malnourished and stunted often also present with zinc deficiency.[24] Other

common manifestations include slow wound healing, reduced appetite and persistent diarrhoea.[24,25]

Malnutrition during critical periods of growth may further affect a child's emotional and intellectual development. An undernourished child's growth, including brain growth and cognitive development, is associated with adverse intellectual outcomes that are large enough to be of importance at the population level.[26] The review paper by Victora et al[22] confirmed a strong association between undernutrition during early childhood with lower schooling levels and ultimately reduced economic productivity. Addressing general food deprivation and inequality would result in substantial reductions in undernutrition and should be a global priority, but major reductions in undernutrition can also be achieved through programmatic health and nutrition interventions.[27]

Interventions during the earliest periods of life are likely to have the greatest impact in preventing child malnutrition. Special emphasis should thus be given to the development of effective interventions to stop the critical faltering that occurs from pregnancy to 24 months.[14]

1.3.2 Consequences of overnutrition and the nutrition transition

Over the past few decades, a major shift has occurred in the structure of diets and physical activity patterns worldwide, leading to an increased prevalence of obesity and NCDs. Previously, these chronic disease patterns were associated mainly with higher-income countries, while lower- and middle-income countries were dominated by famine and hunger. Exposure to Westernised diets and the global availability of cheap hydrogenated vegetable oils and animal fats has now resulted in greatly increased fat consumption and a lower fibre intake among low-income nations. Consequently, higher levels of overweight and obesity now occurs amongst low- and middle-income groups than previously, and is accelerated further by high urbanisation rates. Whereas economic development has led to improved food security and better health, adverse health effects of this nutrition transition include increasing rates of childhood obesity and its health consequences.[17,28]

The most general and immediate consequences of childhood obesity are the psychosocial effects. Overweight children are likely to become targets of social discrimination, including

teasing and victimisation. This social burden, occurring mainly during middle childhood and adolescence, may have lasting effects on self-esteem, body image and economic mobility.[18,29] Orthopaedic, neurological, pulmonary, gastroenterological and endocrine conditions may well be associated with severe childhood obesity, and are becoming increasingly common. Childhood obesity may further presage obesity in adult life with a range of health consequences such as cardiovascular disease, non-insulin-dependant diabetes, gall bladder disease, osteoarthritis and certain types of cancers, ultimately resulting in premature mortality.[29] The increasing prevalence of obesity during childhood suggests that without urgent intervention the health and social consequences will be substantial and long-lasting.[29]

1.4 MALNUTRITION AMONGST CHILDREN IN SOUTH AFRICA

1.4.1 Undernutrition and micronutrient deficiencies

In South Africa, major nutrition-related health issues exist among young children, especially those in rural areas. In 1994, the South African Vitamin A Consultative Group (SAVACG) conducted a national survey with the aim of studying children aged 6–71 months in respect of vitamin A, iron, anthropometric and immunisation status, with the subsidiary objective to establish the prevalence of goitre and breastfeeding occurrence. The survey identified stunting as one of the major problems in the country, especially in rural areas, with one in four children being stunted and one in ten being underweight. Vitamin A deficiency was identified as a serious public health problem. One in three children in the country had a marginal vitamin A status. Those living in rural areas with poorly educated mothers were the most affected. Iron deficiency and anaemia was also identified as an issue, with children aged 6–23 months mostly affected. One in ten children was identified as being iron-depleted, one in twenty severely iron-deficient and one in twenty had iron-deficiency anaemia. One in five children was anaemic, one in fifteen moderately anaemic and one in 500 severely anaemic. Around one in a 100 children was seen with an enlarged goitre. This, however, may not be a true reflection of iodine deficiency and may underestimate the actual prevalence. Almost 90% of children had been breastfed for varying lengths of time, with a greater proportion in rural areas. Factors identified to be causing nutritional problems included poverty, poor sanitation, lack of prolonged and exclusive breastfeeding (EBF), poor maternal nutrition education and the absence of a national nutrition policy. The SAVACG suggested that nutrition education for

mothers is a high priority. Prolonged and EBF should be encouraged and very young children (under 2 years) should be a prime target for nutrition intervention.[30]

The findings of the South African National Food Consumption Survey (NFCS)[31] conducted in 1999 were similar to the findings of the SAVACG national representative sample. The survey identified a high prevalence of underweight and stunting, affecting mostly children aged 1-9 years in lower socio-economic groups and those living in rural or informal urban areas. Diets were generally deficient in energy and had a low nutrient density. About half of the children reviewed received less than half of the recommended intake for several micro- and macronutrients. For South African children overall, just over a half of households experienced hunger, a quarter were at risk of hunger and only one in four appeared food-secure. The survey concluded that, apart from food fortification and supplementation programmes, nutrition education of mothers and caregivers was important to address these issues. The development of FBDGs was recommended to address existing nutrient deficiencies and excesses, and nutrition-related public health initiatives, while taking into account food availability, cultural diversity and dietary patterns.[31]

More recently, in 2013, the results of the first South African National Health and Nutrition Examination Survey (SANHANES-1)[32] were released. The survey was undertaken by the Human Science Research Council (HSRC) and various partners, including the Medical Research Council (MRC) and several South African universities. The results provided critical information on the emerging epidemic of NCDs in South Africa and identified the underlying social, economic, behavioural and environmental factors that contribute to the population's state of health. It was identified that the prevalence of overweight and obesity was highest in the 2–5 years age group, with respective percentages of 18.9% and 4.9% for girls and 17.5% and 4.4% for boys. Compared with the results of the NFCS conducted in 1999,[31] bearing in mind the limitations of cross sectional survey results and direct comparisons made, the prevalence of overweight amongst children aged 1–6 years has almost doubled in the past decade, from 10,6% to 18,2%, while obesity remained unchanged.[32]

The SANHANES-1 results further revealed that the youngest category for boys and girls, i.e. aged 0–3 years, had the highest prevalence of stunting (26.9% and 25.9%, respectively), while the lowest prevalence was recorded in the 7–9 years age group (10%

and 8.7%, respectively). Undernutrition in children younger than 10 years had decreased since the NFCS[31] was conducted, with the exception of stunting among the youngest age group (0–3 years).[32]

Furthermore, when the SANHANES-1[32] findings were compared with those of the 1999 NFCS,[31] again bearing in mind the limitations of cross sectional survey results and direct comparisons made, it was noted that the prevalence of anaemia and iron deficiency anaemia had decreased by 63% and 83.2%, respectively. At the national level, the prevalence of vitamin A deficiency was 43.6%, which is a decrease from the NFCS[31] reported prevalence of 63.6%. The significant improvements in the iron and vitamin A status in children younger than 5 years may reflect the beneficial impact of the food fortification intervention programme. However, despite the decrease in vitamin A deficiency status in the past decade, vitamin A deficiency remains a major public health problem.[32]

The SANHANES-1 data on the increasing prevalence of NCDs, as well as other existing or emerging health priorities, will be essential in developing national prevention and control programmes, assessing the impact of interventions, and evaluating the health status of the country. Identifying population groups at risk of stunting should be a priority to ensure the timely and effective implementation of appropriate nutritional and medical intervention programmes.[32]

1.4.2 Overweight and obesity

Due to the disturbingly high figures of childhood malnutrition and disease in South Africa, previous national nutrition programmes have focused mainly on the management and prevention of undernutrition. However, current overweight and obesity figures are higher than figures for stunting. A secondary analysis of the NFCS identified that around 17% of children were overweight or obese. Those affected were mainly in the higher-income groups in urban areas and especially children aged 1–3 years.[35] The increasing prevalence of overweight and obesity continues into adolescence and adulthood, increasing the risk of obesity-related morbidity and mortality – a similar pattern as seen with the global nutrition transition.[34,35]

1.4.3 Other factors influencing child health

Despite the initiation and implementation of health care programmes in South Africa, child health is still deteriorating, as reflected by the increased rates of infant and child mortality and the high prevalence of preventable childhood diseases. In 2003, the MRC's national burden of disease report[33] estimated that, in 2000, the infant mortality rate had increased to 59 per 1000 live births and 95 per 1000 for children under 5 years. This report further showed that HIV/AIDS is the leading cause of death, accounting for 40.3% of all deaths in children under 5 years. This is followed by low birth weight (11.2%), diarrhoeal disease (10.2%), lower respiratory infections (5.8%) and protein-energy malnutrition (4.3%). Neonatal infections, birth asphyxia and trauma, congenital heart disease, road traffic accidents and bacterial meningitis make up the balance of the ten leading sub-categories for causes of death in children under 5 years in South Africa.[33]

It is evident that HIV and AIDS contribute significantly to the growing prevalence and increased severity of malnutrition and disease in South Africa amongst both adults and children. HIV/AIDS is the primary cause of premature mortality. Manifestations include low birth weight, delayed growth, severe undernutrition with micronutrient deficiencies, and impaired immunity to infections that may lead to death.[33,34] In recent years HIV and AIDS-related mortality among young adults, particularly women has increased. These mortalities, along with the preceding illness has a devastating affect on children, leading to their increased morbidity, mortality and orphanhood.[33]

The burden of parasitic infections may pose a further health risk, not only because they affect child growth and nutrient status, but also due to the immune response caused by intestinal parasites that might favour the progression of disease such as HIV/AIDS and TB.[20] Adams et al[20] identified the high infection rates amongst school children in Cape Town with soil-transmitted helminthiasis[4] and gardiasis[5] at 55,8% and 17,3%, respectively.

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[4] *Helminthiasis refers to any macroparasitic disease of humans and animals in which a part of the body is infected with parasitic worms known as helminths. These parasites are broadly classified into tapeworms, flukes, and roundworms. They often live in the gastrointestinal tract of their hosts, but may also burrow into other organs, where they induce physiological damage. They remain the major cause of wildlife diseases, economic crises in the livestock industry, and human socio-economic problems in developing countries*[8].

[5] *Giardiasis is a parasitic disease caused by* Giardia lamblia*. The* Giardia *organism inhabits the digestive tract of a wide variety of domestic and wild animal species, as well as humans and is the most common pathogenic parasitic infection in humans worldwide.*[8]

These infections are associated with serious clinical disease and create a huge burden of subclinical morbidity in children and women. Routinely carrying out deworming programmes has proven to be an effective method of preventing these infections. The wider implementation of such programmes in South Africa should not be delayed.[20,21]

1.4.4 National plans to address malnutrition in South Africa

It is evident that the socio-economic diversity of South Africa is accountable for multifactorial influences on the nutritional status of children. The presence of hunger and food insecurity affecting a large proportion of lower-income societies, the nutrition transition with the coexistence of under- and overnutrition, and also the nutritional-related diseases caused by HIV, AIDS and TB present a complex series of challenges to the planning and implementation of nutrition-related policies. An interdisciplinary and multi-sectorial approach at both primary and secondary intervention levels are essential to address the varied nutritional issues. Special attention to vulnerable groups such as infants and young children, may further help to reduce the prevalence of malnutrition.[36, 37,38]

Several nutrition intervention programmes have been implemented to reduce the prevalence of malnutrition among young children in South Africa, however many of these have failed to improve their nutritional health. Failures were most likely due to inadequate implementation and evaluation of these programmes. Urgent action to improve the effective and accurate implementation of current nutritional programmes and strategies in South Africa, as well as regular evaluation to identify pitfalls and overcome shortcomings were required.[36]

In 1994, the Integrated Nutrition Programme (INP) was formulated and adopted by the Department of Health as the nutrition strategy for the country with the aim of reorganising previous fragmented nutrition intervention programmes to be more integrated and comprehensive. The INP addresses interventions at all levels and includes health facility-based, community-based and nutrition promotion strategies.[36,37] The INP also adopted the United Nations International Children's Emergency Fund (UNICEF) Conceptual Framework (see Figure 1.4),[39] which views undernutrition as the result of underlying causes, and the implementation of nutrition programmes as an ongoing process of assessment, analysis and action.[38]

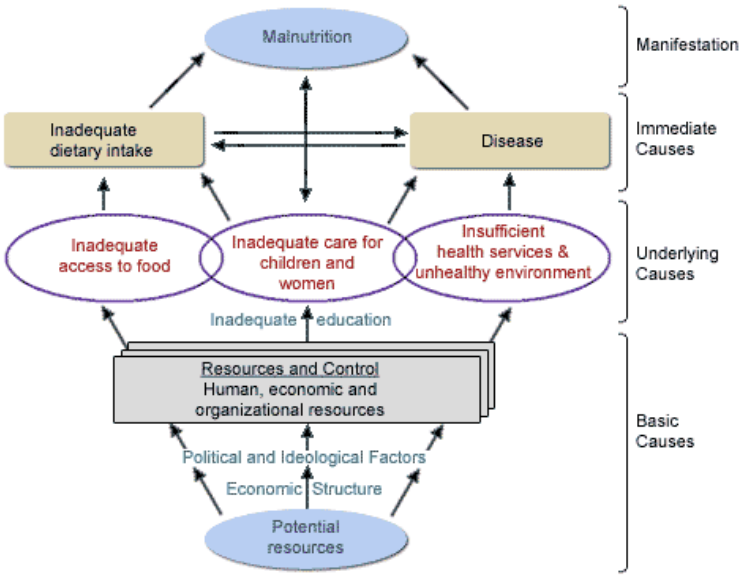


Figure 1.4: UNICEF conceptual framework: causes of undernutrition[39]

Interventions in support of the INP's vision and mission, aimed at infants and young children, include maternal supplementation; optimal nutrition during pregnancy; infant and young child feeding, with a focus on the Baby-Friendly Hospital Initiative (BFHI) (now named the Mother Baby Friendly Initiative – MBFI)[40] to promote, support and protect breastfeeding and encourage optimal complementary feeding; the mandatory fortification of maize and wheat flour with multiple micronutrients; a vitamin A supplementation programme; use of the Road to Health booklet (RtHB) for growth monitoring and promotion (GMP); the Integrated Management of Childhood Illnesses (IMCI); community-based approaches and management of severe acute malnutrition (SAM).[40]

The South African Infant and Young Child Feeding (SAIYCF) policy, focusing on infants and children 0-60 months and promotes exclusive and continued breastfeeding and appropriate introduction of complementary foods at 6 months. The purpose of this policy is to standardize and harmonize infant feeding messages, to guide healthcare providers on how to address threats and challenges to infant feeding, and to promote optimum infant feeding practices. Additionally, the new RtHB for children 0-60 months was launched by the Department of Health and rolled-out in February 2011. The RtHB contains more information than the previously used Road to Health card (RtHC) and addresses several health aspects including developmental screening, immunisation records, vitamin supplementation and deworming. It further incorporates the 2006 WHO growth standards and does not only focus on weight-for-age, as in the past, but also includes height-for-age

and weight-for-height tables for assist with earlier detection of stunting. Furthermore, the RtHB also aims to convey important health messages, specifically nutrition messages in line with the South African PFBDGs. These strategies is a step in the right direction for addressing the child nutrition problem in the country.[38]

The Integrated Management of Childhood Illness (IMCI) strategy was developed by UNICEF and the WHO in 1995 and implemented in South Africa in 1997. The IMCI includes integrated clinical guidelines and a training course developed for health workers in PHC facilities for effective management of the sick child. The guidelines address the most important case management and preventative interventions against the leading causes of childhood mortality in developing countries including pneumonia, diarrhoea, malaria, measles and malnutrition. The training course incorporates prevention of disease through promotion of breastfeeding, counselling to solve feeding problems and immunisation of sick children.[38]

Despite some successes of the INP in South Africa, programmes have failed to restore adequate growth rates among impoverished children. South African nutrition strategies and interventions are in line with current international recommendations. The limited success in improving the nutrition situation in South Africa is therefore not due to inappropriate policies and strategies or lack of knowledge about relevant solutions. It would appear that inadequate implementation and scale of the programmes are major contributors to the current situation as well as the need for human resources for the successful implementation of the INP and regular evaluation of programmes. Since one of the objectives of the SAIYCF policy is “to standardise and harmonise messages relating to infant and young child nutrition” in order to realise the vision: “to promote optimal nutritional status, growth, development and improve health and survival outcomes of infants and young children in SA”. The testing and revision of nutrition educational tools, such as the PFBDGs, along with effective implementation, are of importance.[36]

1.5 THE DEVELOPMENT AND TESTING OF FOOD-BASED DIETARY GUIDELINES (FBDGs)

1.5.1 The WHO and FAO Expert Consultation report: Background to the formulation and use of FBDGs

The World Health Organization (WHO) and the Food and Agricultural Organisation (FAO) convened an International Conference on Nutrition in 1992 in Rome. The aim was to identify and encourage the development of strategies that can be applied globally to improve food consumption and consequently nutritional status, particularly chronic malnutrition, micronutrient deficiencies and diet-related communicable and noncommunicable diseases.[6] The World Declaration and Plan of Action for Nutrition[1] was adopted here; it promoted, amongst other strategies, appropriate diets and healthy lifestyle through the development of national action plans applicable to each cultural context. The overall goal of the action plan was to eliminate hunger, starvation and nutritional deficiencies, and also to reduce diet-related communicable and noncommunicable diseases. It further called for the dissemination of nutrition information through 'sustainable food-based approaches', encouraging dietary diversity through the production and consumption of micronutrient-rich foods, including traditional foods. Subsequently, a joint WHO and FAO Expert Consultation was convened in 1995 in Cyprus on the Preparation and Use of Food-based Dietary Guidelines.[6]

The aim of this WHO/FAO Expert Consultation was to establish the scientific basis for developing and using FBDGs to improve food consumption patterns and nutritional well-being of individuals and populations.[6] It was recognised that existing nutrient-based guidelines were difficult for the general population to understand and interpret, and were not necessarily culturally appropriate. Furthermore, much knowledge is still needed about nutrients and their interactions to warrant the effective utilisation of nutrient-based dietary guidelines.[6] There is now better evidence available of the effect of specific foods and beverages, daily eating habits and the combination of foods on health.[27] The FAO/WHO committee therefore concluded that FBDGs that were specific to each country would be more effective as a nutrition education tool to address local nutrition-related public health issues, and hence changed the focus from the traditional nutrient-based recommendations to locally available food. In 1998, the report of this joint FAO/WHO Expert Consultation

was published and stipulated the scientifically based recommended process for the development and evaluation of FBDGs in different parts of the world (see Box 1).[6]

Box 1: FAO/WHO suggested steps for developing food-based dietary guidelines[6,10]

- Form a representative working group
- Members of the group set nutritional objectives based on nutrition-related diseases, food availability and food intake patterns of the country
- Formulate after full discussions and considerations a preliminary set of FBDGs that could be useful
- Pilot-test the wording of the FBDGs with consumer groups and revise as needed
- Compile technical support documents for each FBDG
- Finalise the technical support documents and submit to national and international interest groups for comments and consider changes accordingly
- Conclude, adopt, publish and disseminate final report
- Implement the FBDGs
- Measure the impact of FBDGs on eating patterns

1.5.2 FBDGs as an education tool

Dietary guidelines are sets of recommended statements of dietary advice aimed at the general population in order to address diet-related conditions and promote overall nutritional well-being. Recommended Dietary Intakes (RDIs), on the other hand, are quantitative estimates of human requirements for essential nutrients to maintain health and are mainly used by nutrition and other health professionals. Efforts to express nutrient needs for individuals in terms of RDIs have received much attention in many countries, including South Africa, to serve as a goal for good nutrition.[6,9] Although RDIs form the scientific basis to contribute to the development of dietary goals, they are often misapplied and have caused confusion among policymakers, nutrition educators and especially the consumers.[6]

Consumers think in terms of food rather than nutrients, hence the concept of disseminating information through FBDG is more sensible. The term ‘food-based dietary guidelines’’ can be described as a practical way to express the principles of nutrition education mostly as foods, without using scientific terms. They are intended for use by the general public to help achieve dietary goals in a population. Dietary goals may vary among population groups according to the prevalence of nutritional issues. FBDGs should therefore be

designed by taking in consideration a population's customary dietary habits, their socio-economic and cultural backgrounds, as well as the ecological, biological and physical environments in which the population lives.[6]

The FAO/WHO Expert Consultation report recognises that a healthy lifestyle is multifactorial and hence, although the FBDGs focus mainly on nutrition, countries are encouraged to develop integrated local guidelines incorporating messages with other policies related to health promotion.[6]

1.5.3 The development of FBDGs in South Africa

Motivated by the WHO and FAO initiative, the Nutrition Society of South Africa (NSSA) established a working group in 1997 to develop local FBDGs.[9] It was recognised that, at that point in time, the existing South African dietary guidelines were inappropriate for the local population. They were nutrient-based and targeted only at a population following a typical Western diet, without considering the availability, accessibility and affordability of the food and the lifestyle needs of the diverse South African communities.[9,10]

The working group included members with a diverse background of experience and training in nutrition, including representatives from academic institutions, the DOH Nutrition Directorate, the MRC, UNICEF and several other nutrition organisations in South Africa. They adopted the FAO/WHO process for developing FBDGs (Box 2) that would adequately address local diet-related public health issues of over- and undernutrition in disadvantaged as well as affluent communities. They further considered the diverse South African cultures, including their dietary habits, lifestyles, living conditions and socio-economic backgrounds.[9,10] During 1999 and 2000, following an extensive literature review and discussions, 11 guidelines were developed and tested across a wide spectrum of social and cultural groups. The testing of the developed messages among women was funded by UNICEF. The process of refining and adapting continued until a final set of FBDGs for healthy South Africans aged 7 years and older (2003 version; the first set of South African food-based dietary guidelines) was approved and adopted by the DOH in 2003 (see Box 2).[7,9,10]

Box 2: The 2003 version of the food-based dietary guidelines for healthy South Africans older than 7 years[10]

- Enjoy a variety of foods
- Be active
- Make starchy foods the basis of most meals
- Eat plenty of vegetables and fruits everyday
- Eat dry beans, peas, lentils and soy regularly
- Chicken, fish, milk, meat or eggs could be eaten daily
- Eat fats sparingly
- Use salt sparingly
- Drink lots of clean, safe water
- If you drink alcohol, drink sensibly
- Use food and drinks containing sugar sparingly and not between meals

Alongside the development of the above set of FBDGs, it was recognised that these guidelines should be adapted for groups with special dietary needs, including people living with HIV and AIDS, children under 7 years, the elderly, and pregnant and lactating women. Consequently, additional working groups were initiated in 2000 to develop FBDGs for the specific priority groups.[9,10]

1.5.4 The development of preliminary paediatric FBDGs (PFBDGs) in South Africa

Infants and young children have unique nutritional requirements with regard to growth, health and development. Malnutrition at an early age, especially from birth to 2 years, may lead to faltering growth, micronutrient deficiencies, common childhood illnesses, more infections, slower recovery and more severe illness, thereby increasing the risk of childhood mortality and morbidity.[41–43] The report of a joint FAO/WHO Expert Consultation (1998) stipulated that constant monitoring is required for infants and young children, since in almost every country it is a particularly vulnerable group and extra care is needed to ensure that they achieve their potential for growth and development.[6] Considering the nutritional concern for infants and young children, their unique nutritional requirements and the local diet-related public health issues, another South African working group was formed in 2000 to develop paediatric food-based dietary guidelines (PFBDGs) for healthy South African children under the age of 5 years.[9,10] This working group followed the

recommended FAO/WHO guidelines in developing the PFBDGs; the same process was followed as for the development of the FBDGs for adults (Box 1).[6,10]

The initial cut-off point of 5 years for the PFBDGs that concurred with the conventional WHO cut-off was later altered to children younger than 7 years, to accommodate infants and young children up to school-going age. This age category coincides with the RDI cut-off values, as well as the age at which South African children commence school and when vulnerable children are subject to the National School Nutrition Programme.[10] The working group further decided to form three sub-groups for the development of separate guidelines for children aged 0–6 months, 6–12 months and 1–7 years. They reasoned that these sub-groups would reflect local public health issues identified by mortality and morbidity data, and address the specific nutritional needs of children at different developmental stages. Moreover, these would coincide with the WHO dietary reference values[6]. It would further facilitate the WHO recommendation of EBF for infants younger than 6 months, the introduction of complementary foods at 6 months and the introduction of healthy family foods at 12 months once the child has been weaned. Although the WHO indicates that breastfeeding may continue beyond the age of 2 years, the Working Group decided to address this aspect in a supplementary document of the 6–12 months age group. This would then allow for the guidelines for the 1–7 years age group to focus on the further introduction of balanced, healthy family foods.[6,10]

Key concepts for each age category were identified during workshops by members of the Working Group and other external partners from Maternal and Child Health, NGOs and Oral Health. Relevant nutrition-related guidelines and interventions were also taken into consideration. Preliminary messages were suggested for each group and screened among mothers/caregivers of children in the target age range. Messages were also surveyed among randomly selected dieticians.

Finally, in May 2003, the Working Group approved three preliminary sets of PFBDGs (Boxes 3, 4, 5), technical support papers were published in 2007 and consumer testing commenced to ensure they meet the requirements of the diverse South African population.[10] However, the PFBDGs were not fully adopted by the DOH, because, due to funding constraints, the message had not been fully tested.[7]

[6] *The WHO dietary reference values use the following age cut-offs: 0-6 months, 6-12 months, 1-3 years, 3-5 years and 5-7 years*[44]

Box 3: The 2007 version of the preliminary paediatric food-based dietary guidelines for infants younger than 6 months[10]

- Enjoy time with your baby
- Breastfeeding is best for your baby for the first 6 months
- Clean your baby's mouth regularly
- Take your baby to the clinic every month

Box 4: The 2007 version of the preliminary paediatric food-based dietary guidelines for infants 6-12 months of age[10]

- Enjoy time with your baby
- From 6 months start giving your baby small amounts of solid foods
- Gradually increase your baby's meals to five times a day
- Keep on breastfeeding your baby
- Offer your baby clean safe water regularly
- Teach your baby to drink from a cup
- Take your baby to the clinic every month

Box 5: The 2007 version of the preliminary paediatric food-based dietary guidelines for chidren 1-7 years of age[10]

- Encourage children to eat a variety of foods
- Feed children 5 small meals a day
- Make starchy foods the basis of a child's main meals
- Children need plenty of vegetables and fruit every day
- Children need to drink milk every day
- Children can eat chicken, fish, meat, eggs, beans, soya or peanut butter every day
- If children have sweet treats or drinks, offer small amounts with meals
- Offer children clean, safe water regularly
- Take children to the clinic every 3 months
- Encourage children to play and be active every day

1.5.5 Revising the South African FBDGs messages

Nutrition is a continually developing field, and ongoing revision of nutrition-related educational programmes is essential to ensure that they convey the most recent evidence-based messages in the most effective way. The WHO/FAO report of 1998 therefore suggested regular monitoring and evaluation of FBDGs in terms of the process of implementation and their outcomes.[6,7]

In South Africa, some evaluation studies have been performed to asses the consumers' comprehension and applicability of the preliminary PFBDGs.[11–13] Consumers generally received the FBDGs positively, but confusion existed around certain concepts and terminologies, leading to misconceptions that may cause a barrier to effective implementation. It was suggested that these concerns could be addressed with the reformulation and retesting of certain guidelines, and with the provision of explanatory consumer information and training materials for health workers.

A study was also undertaken, by Keller and Lang,[46] to examine the implementation of FBDGs in four diverse countries, including Chile, Germany, New Zealand and South Africa. Although data about the impact of implemented FBDGs on policies and consumers' dietary habits were incomplete, FBDGs were seen as a valuable education tool by stakeholders. It was suggested that policy tools should however move beyond the implementation stage to further form part of wider public health nutrition strategies. Improvements in the implementation of FBDGs were identified as being particularly crucial considering the epidemic of NCDs.

In view of the results of the above studies and the nutrition transition with the changing dietary habits of the South African population, the initial working group recommended the review and adaptations of local FBDGs on a regular basis.[9] In concurrence with their recommendation, the DOH initiated a project in 2011, funded by the FAO, for the development of a country-specific food guide for South Africa (Figure 1.5). It was decided to review the existing FBDGs as part of the project. This would ensure that the new food guide would be compatible with the revised FBDGs for adults and children older than 5 years in order to be used jointly as an effective education tool. Consequently, another national working group was assembled. During a workshop in March 2011, expert groups, including a group focusing on paediatric nutrition, were formed to review new literature and

make suggestions regarding the revision of specific guidelines. The findings and recommendations of these groups were reported back to the national working group during a meeting in July 2011. At this meeting it was decided to formulate a revised set of general FBDGs for adults and children older than 5 years and a separate set of paediatric guidelines for children under 5 years. The revised age categories were introduced to coincide with the changes in school-going age of South African children – children now start grade R at the age of 5 years. Additionally, the PHC system takes responsibility for addressing the health of children aged 0-5 years and utilise the RtHB, with an explicit focus on this age range, as a comprehensive SA tool to monitor children's health.[7]

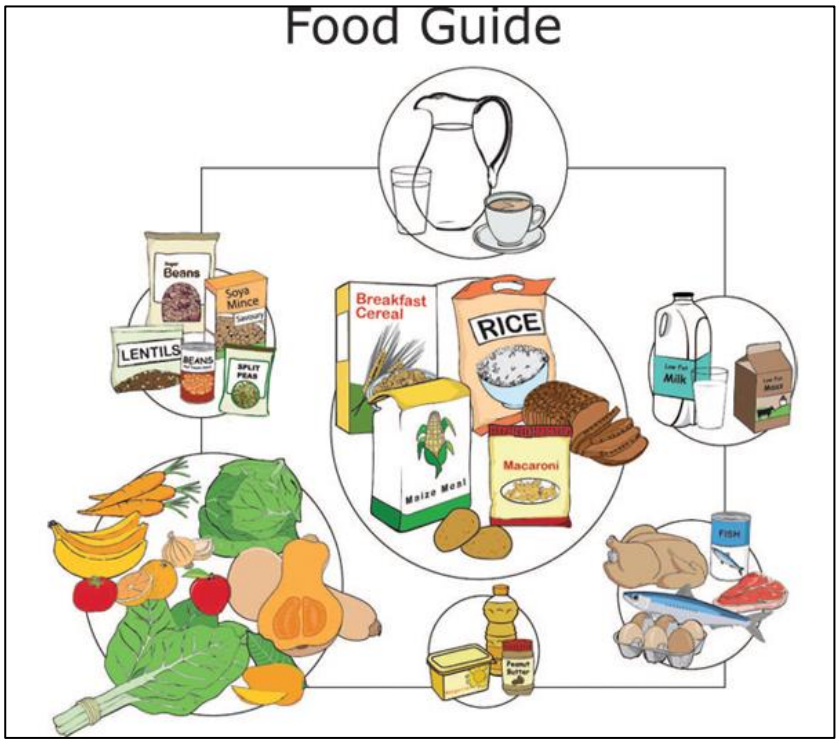


Figure 1.5: The South African food guide[7]

Suggested changes to the 'general' guidelines (i.e. aimed at children older than 5 years, adolescents and adults) included minor changes to the phrases and wording of some guidelines, as well as the addition of a guideline pertaining to milk, a focus on the quality of fats in the fat guideline and the removal of the alcohol guideline, as the latter caused confusion and alcohol abuse was addressed by other initiatives in South Africa. A final set of 'general' guidelines, with technical support papers, was formulated and confirmed during a meeting in June 2012 (see box 6).[7]

Box 6: Revised general food-based dietary guidelines for South Africans; 2013[7]

- Enjoy a variety of foods.
- Be active!
- Make starchy foods part of most meals.
- Eat plenty of vegetables and fruit every day.
- Eat dry beans, split peas, lentils and soya regularly.
- Have milk, maas or yoghurt every day.
- Fish, chicken, lean meat or eggs can be eaten daily.
- Drink lots of clean, safe water.
- Use fats sparingly. Choose vegetable oils, rather than hard fats.
- Use sugar and foods and drinks high in sugar sparingly.
- Use salt and foods high in salt sparingly.

1.5.6 Revision of the 2007 South African PFBDGs

The nutritional status of infants and young children in South Arica remains a concern – as it has for decades. The persistent high levels of stunting along with the growing rates of overweight and obesity amongst children emphasises the need for specific paediatric dietary guidelines to address these issues. Furthermore, non-EBF and the inappropriate introduction of complementary foods may have a significant effect on child health and mortality.[14] Although South Africa has relatively little data available on local infant and child feeding practices, studies have long indicated that the early introduction of complementary food and inappropriate breastfeeding practices have probably contributed to the current malnutrition status of the country.[7,47,48] Subsequently, parallel to the revision of the general FBDGs at the workshop held in March 2011, initiated by the DOH (refer to Section 1.5.5), the Paediatric Working Group identified the need to review existing nutrition guidelines. They agreed on four age categories for the revised paediatric FBDGs: 0–6 months, 6–12 months, 12–36 months and 3–5 years.[7] The previous studies performed since 2003 to test the comprehension and applicability of the preliminary paediatric FBDGs had identified the need to adapt and rephrase some of the messages.[11–13] These suggestions were incorporated in the most recent set of proposed 2013 paediatric FBDGs (see Boxes 7-10). Further testing of the revised guidelines is now needed to ensure that messages are well understood before deciding on the exact wording of the final guidelines.[7]

Box 7: Proposed paediatric food-based dietary guidelines for infants 0-6 months of age; 2013[7]

- Give only breast milk, and no other foods or liquids, to your baby for the first six months of life.

Box 8: Proposed paediatric food-based dietary guidelines for infants 6-12 months of age; 2013[7]

- At six months, start giving your baby small amounts of complementary foods, while continuing to breastfeed to two years and beyond.
- Gradually increase the amount of food, number of feeds and variety as your baby gets older.
- Feed slowly and patiently and encourage your baby to eat, but do not force him or her.
- From six months of age, give your baby meat, chicken, fish or egg every day, or as often as possible.
- Give your baby dark-green leafy vegetables and orange coloured vegetables and fruit every day.
- Start spoon-feeding your baby with thick foods, and gradually increase to the consistency of family food.
- Hands should be washed with soap and clean water before preparing or eating food.
- Avoid giving tea, coffee and sugary drinks and high-sugar, high-fat salty snacks to your baby.

Box 9: Proposed paediatric food-based dietary guidelines for children 12-36 months of age; 2013[7]

- Continue to breastfeed to two years and beyond.
- Gradually increase the amount of food, number of feedings and variety as your child gets older.
- Give your child meat, chicken, fish or egg every day, or as often as possible.
- Give your child dark-green leafy vegetables and orange coloured vegetables and fruit every day.
- Avoid giving tea, coffee and sugary drinks and high-sugar, high-fat salty snacks to your child.
- Hands should be washed with soap and clean water before preparing or eating food.
- Encourage your child to be active.
- Feed your child five small meals during the day.
- Make starchy foods part of most meals.
- Give your child milk, *maas* or yoghurt every day.

Box 10: Proposed paediatric food-based dietary guidelines for children 3-5 years of age; 2013[7]

- Enjoy a variety of foods.
- Make starchy foods part of most meals.
- Lean chicken or lean meat or fish or eggs can be eaten every day.
- Eat plenty of vegetables and fruit every day.
- Eat dry beans, split peas, lentils and soya regularly.
- Consume milk, *maas* or yoghurt every day.
- Feed your child regular small meals and healthy snacks.
- Use salt and foods high in salt sparingly.
- Use fats sparingly. Choose vegetable oils, rather than hard fats.
- Use sugar and food and drinks high in sugar sparingly.
- Drink lots of clean, safe water and make it your beverage of choice.
- Be active!
- Hands should be washed with soap and clean water before preparing or eating food.

1.6 CONSUMER TESTING OF THE PRELIMINARY 2007 PFBDGs FOR INFANTS AGED 6–12 MONTHS

The WHO/FAO panel recommended that, prior to the release of FBDGs, field testing should be performed among the general public. This would contribute to the development of clear and simple nutritional guidelines, incorporating social and cultural preferences.[6] The population of South Africa is extremely diverse and extensive assessments of the comprehension of FBDGs by different cultural and social groups are required to ensure that the guidelines are applicable to all South Africans.

The period from birth to 2 years is generally considered the ‘critical window’ for optimal growth, health and development of a child. This is the peak age for the presentation of malnutrition, including growth faltering and micronutrient deficiencies, as well as common childhood illnesses. After the age of 2 years, it is very difficult to reverse these situations. The high prevalence of poor breastfeeding and complementary feeding practices along with infectious diseases in developing countries are some of the major causes of malnutrition during the first two years of life. It is therefore essential to ensure optimum nutrition at this stage and to equip caregivers with appropriate nutritional guidelines.[41]

The present study aimed to contribute to the process of testing local PFBDGs by assessing the comprehension of the 2007 preliminary PFBDGs for a specific language and socio-cultural group in this critical age category that has not yet been assessed. Previous studies undertaken to test the comprehensibility, cultural acceptability and practical application of the 2007 preliminary PFBDGs for the different age categories were performed mainly in the Western Cape province on Afrikaans-, English- and Xhosa-speaking mothers or caregivers.[11–13] Northern Sotho is one of South Africa's official languages and the fourth most common home language, spoken by 9.1% of the population. It is the language of the Limpopo province (north of Gauteng), where it is spoken by more than half of the provincial population. The PFBDGs have not been tested in Gauteng. The vulnerable group of 6–12-month-old infants and their mothers/caregivers, of the Northern Sotho community were consequently identified as a suitable study group.

The study protocol was composed during 2011 and 2012 and fieldwork was performed in 2013 (Box 6). At this time the PFBDGs were under review, however there was no indication of when these would have been published or shared. Due to time constraints, pressure to complete the research study as well as limited funding, it was decided to continue with the testing of the 2007 PFBDGs. At the time it was not known how long the research would have been delayed if the revised PFBDGs were to be tested, interpreted and published. It was felt that the work could still inform the current process, given that the study population was a very low income, peri-urban group with socio-cultural and language profile that had not been previously tested.

The review and discussion of this report consequently focus on the first preliminary set of PFBDGs of 2007 (Box 3). However the information that emerged from this research process could provide valuable insights into future assessments of the 2013 revised set of the South African PFBDGs and possibly address interrelated themes.

1.6.1 The evidence-base support for the preliminary 2007 version of the South African PFBDGs for infants aged 6–12 months

Breastfeeding is known to be the best way of feeding infants and young children. The joint WHO/UNICEF 'Global Strategy for Infant and Young Child Feeding' affirms that optimal infant feeding consists of EBF for the first 6 months of life, followed by the appropriate and adequate introduction of complementary foods at around 6 months of age with continued

breastfeeding for up to 2 years and beyond. Not only do these breastfeeding practices meet the nutrition needs of infants and children for optimal growth and development, but they also offer other health and socio-economic benefits. The poor breastfeeding rates, in conjunction with high rates of infant and child mortality and morbidity in South Africa, have lead to the adoption of the international breastfeeding guidelines for exclusive and extended breastfeeding practices. Therefore, it remains a priority to implement these guidelines in all current and future breastfeeding programmes and interventions, including the South African paediatric food-based dietary guidelines.[60]

1.6.1.1 Guideline 1: "Enjoy time with your baby"

Guideline 1 addresses the importance of the mother enjoying time with her baby. Although this guideline is not directly diet-related, the psychological bonding between mother and baby is seen as an extremely important component of care, which may affect a child's nutritional status and the well-being of both mother and child. The UNICEF conceptual framework (Figure 1.4)[39] places child care at the centre of any intervention aimed at meeting the child's needs and identifies lack of care as an underlying cause of malnutrition. Care is defined here as the provision of time, attention and support to the child in order to meet its physical, mental and social needs. Care is conceptualised as the child's link between available food and health resources as well as the child's physical growth and psychological development.

Numerous studies support the link between child care and optimum growth and development, as reviewed in the PFBDG technical support paper by Tomlinson and Landman.[49] Children are interactive social beings and demonstrate a social interest within hours after birth. They are therefore particularly vulnerable to early disruptions in interactions with their caregivers. The BFHI therefore also encourages mother-child interaction immediately after birth and recognises that, besides providing nutrition, breastfeeding simultaneously satisfies the child's needs for affection and protection.[38]

Physical growth and psychological development of infants and children are intimately linked. It may be assumed that there is a direct relationship between food availability and nutritional status. The relationship is far more complex, however. There are various factors that may affect the quality and quantity of food intake, leading to possible under- or overnutrition, e.g. mother-infant interaction, family factors and parental control, infant and child temperament, genetic factors, environmental factors, etc. It is expected that anything

that interferes with the ability of the mother to be sensitive and responsive to the cues from her infant during feeding may affect the child's nutritional status and have a long-term effect on the child's growth. Factors affecting the mother's ability to interact or respond appropriately include the mother's emotional well-being, e.g. post-natal depression, food availability and insecurity, and support from macro- and micro-systems, i.e. family support, support from friends and neighbours, community-based organisations or national intervention programmes.[49]

Spending quality time together is therefore essential for the total health and well-being of both mother and baby; hence, the South African PFBDGs working group decided that it was imperative to include this guideline in the 2007 set of guidelines.[10]

1.6.1.2 Guideline 2: "From 6 months start giving your baby small amounts of solid foods"

The WHO recommends the introduction of complementary foods at the age of 6 months, while breastfeeding continues for up to 2 years and beyond. Laying a good nutritional foundation through the appropriate introduction of complementary foods, in addition to breast milk, may reduce the risk of developing any major nutrient deficiencies that are common during childhood.[41]

Up to the age of 6 months, breast milk alone is sufficient to meet the nutritional requirements of a young infant. EBF for 6 months offers several benefits for both mother and child: it offers the child protection against gastrointestinal infections, and facilitates maternal postnatal weight loss.[47,48] There is sufficient evidence regarding 6 months as the appropriate age to introduce complementary foods while breastfeeding continues.[50] At 6 months, infants are developmentally ready to start with solid foods but, at this stage, breast milk alone is insufficient to meet their nutritional needs.[41] Permeability of the small infant's gut for intact protein molecules is considered a risk factor for the development of food allergies. Early introduction of solid food before the age of 4 months has been associated with a higher incidence of atopic dermatitis. By 6 months, the infant's systematic immunological responses are more mature and the mucosal barrier is well developed, preventing gastrointestinal permeability of large molecules, and hence reducing the risk of the development of food allergies and intolerances.[51] Furthermore, several developmental stages around the age of 6 months correlate with an infant's ability to ingest foods. At this age, an infant is able to sit upright with sufficient head control to

allow for chewing and swallowing of soft foods, and they are able to transfer food from the front of the tongue to the pharynx. They can also increasingly use finger foods as their eye-hand coordination develops. Tooth eruptions, the inclination of putting objects in the mouth and an increased interest in food, e.g. when others are eating, are further indicators of readiness for solid foods around this age.[52] There is no proven benefit to giving infants aged 4–6 months any additional foods and there is no evidence to dispute the recommendation of EBF for the first 6 months of life.[47] In their paper on maternal and child undernutrition (global and regional exposures and health consequences), published in 2008, Black et al[14] report that suboptimal breastfeeding practices, including non-EBF, has resulted in 1,4 million deaths and represents 10% of the disease burden in children under 5 years.

Apart from the timely introduction of complementary foods, the provision of appropriate good quality food is just as important to maintain optimal growth and development. According to a recent survey documented in the State of the World's Children 2010 report by UNICEF,[53] current complementary feeding practices are undesirable. Although timely introduction of complementary foods may be common practice in many countries, the quality of the diet can be poor. A large number of breastfed children aged 6–9 months do not receive complementary foods every day. The high prevalence of stunting[15] (see Section 1.2) is further evidence of the poor quality of feeding practices in infants and young children. The nutritional challenge in developing countries continues to be related to the adequacy and quality of complementary foods for optimal growth and development.[53]

In South Africa, there is little consistency in the complementary feeding practice, with great variances between cultural and socio-economic groups. The majority of infants receive solid foods at the age of 4 months, with many introduced to solids before the age of 3 months. Infants in more affluent areas are often introduced to a wider range of foods at an earlier age, while the solid foods given to infants in less affluent areas are often of a lower quality with inadequate nutritional value, given either too early or too late.[54] Incorrect beliefs that breast milk alone is not sufficient to satisfy the infant is one of the main barriers to the timely introduction of solids foods.[42,55]

Infants and children younger than 2 years experience rapid growth rates with increased nutrient needs. Due to their small stomach capacity and the relatively small amounts of complementary foods consumed at this age, the quality of complementary foods must

ideally be nutrient dense.[41] Complementary diets in developing countries are often deficient in nutrients, because of the lack in variety and the dependence on plant-based staples such as maize.[48] Maize meal porridge is a bulky food of relatively low-nutrient value. It is often used by South African mothers from lower socio-economic groups to introduce solids to their infants. It is typically made with water to a thin consistency. Maize porridge is high in phytates, which inhibit the absorption of iron and zinc.[42] Despite being fortified, it is unlikely that a staple foods such as maize meal will impact significantly on infant feeding because of the small amounts that infants consume.[56] This, together with the low energy density of maize, may hamper the growth of infants and increase the risk of stunting during early childhood.[42,56]

In addition to increased energy requirements during this rapid growth period, infants also have increased iron requirements. Furthermore, at around 6 months after birth, iron stores become depleted and complementary foods should provide almost all of the infant's iron requirements. Small quantities (25 g) of high-quality iron-containing foods such as meat must be taken every day to prevent iron deficiency. The daily intake of animal products is associated with improved intake of nutrients such as protein, iron, zinc and vitamin A, and may prevent deficiencies in children, resulting in better growth outcomes.[48]

Complementary foods should further include a variety of fruit and vegetables. Apart from providing important nutrients, they are low in energy and may help prevent the development of overweight and obesity. Children who are exposed to a variety of fruit and vegetables, as well as various textures and flavours, during infancy are also more likely to accept them later in life.[57] Fruit and vegetables are, however, rather expensive and sometimes less available, presenting a major constraint to their consumption among the lower socio-economic groups of South Africa.[48]

The first complementary foods ideally take the form of a smooth purée. This is followed by the gradual introduction of a soft lumpy texture at around 7 months, and then soft finger foods requiring chewing at 8–9 months. These stages should finally lead to the introduction of chopped family meals at around the age of 1 year. The ability of children to eat textured foods depends on their neuromuscular development. Providing food with an inappropriate consistency may prevent children from eating, or slow them down, thereby compromising their nutritional intake. The WHO recommends the introduction of lumpy foods at 6–9 months of age, while gradually increasing the consistency as the infants gets

older.[41] The inclusion of courser textures and varied flavours with increasing age and the encouragement of self-feeding with soft pieces of finger foods has proved to improve healthy eating behaviour, as well as a child's self-regulation and -control of food intake later in life.[41]

The period 4–7 months is believed to be a critical window of opportunity in the acceptance of tastes and textures. Children who are exposed to foods at this age are more likely to accept them after one exposure, compared to older children at 10 months, who may need 10 or more exposures.[41,57] Infants who are introduced to lumpy foods after 9 months are more likely to experience long-term feeding difficulties and reduced consumption of important food groups.[57] In South Africa however, EBF is supported for the first 6 months of life.[60] Taste exposure up to the age of 6 month, will therefore be experienced through breast milk and from 6 months of age, different tastes and textures could be introduced with complimentary foods.[48,60]

1.6.1.3 Guideline 3: "Gradually increase your baby's meals to five times a day"

When commencing with complementary foods, the recommendation is that small amounts of nutrient-dense food should be introduced and gradually increased as the infant gets older, while frequent breastfeeding continues. The quantity and frequency of complementary foods may vary, and specific guidelines for all in this age category are inappropriate. Each child's individual needs depend on the volume of breast milk he/she consumes and its growth rate (see Table 1.1). However, rough guidelines regarding quantities and frequency suggest two to three meals per day at 6–8 months; at 9–11 months the provision of three to four meals per day, and at 12–24 months three to four meals plus one or two additional snacks[7] per day (i.e. five meals per day) should be offered.[41]

Although nutrient density will influence the required food quantities, it can be assumed that food with an energy density of 4–6 kJ/g will result in the following estimated daily requirements:

[7] *A snack is defined as convenient, easy to prepare and usually self-fed food consumed between meals and should ideally this be a nutrient-dense option.*[48]

- 140–190 g of complementary foods from 6–8 months
- 200–280 g from 9–11 months
- 380–500 g from 12–23 months[48]

Maize porridge, the most frequently used complementary food in South Africa, has an energy density of less than 1 kJ/g. In order to meet the nutritional requirements from the consumption of lower quality complementary food, an infant would need to consume much larger quantities or more frequent meals.[48]

Table 1.1: Total energy requirements derived from complementary foods given to healthy, breastfed infants with an 'average' breast milk intake in developing countries[48]

Age (months)	Energy requirements (kJ/day)	Average breast milk energy intake in developing countries (kJ/day)	Average breast milk energy intake in industrialised countries (kJ/day)	Energy needs from complementary foods in developing countries (kJ/day)	Energy needs from complementary foods in industrialised countries (kJ/day)
6–8	2 583	1 735	2 041	840	546
9–11	2 881	1 592	1 575	1 260	1 302
12–23	3 755	1 453	1 315	2 310	2 436

From 8 months, one of the meals may be replaced by a self-fed snack to encourage responsive feeding practices that are essential to cultivate skills for self-regulation and self-control of food intake. Responsive feeding refers to the interactive relationship between child and caregiver, where the child indicates hunger via verbal or nonverbal cues, followed by the caregiver's immediate response of providing appropriate food in relaxed environment. The intake of complementary food is influenced by various factors, including the child's appetite and the caregiver's behaviour. A relaxed mealtime atmosphere and the avoidance of force-feeding may create a healthy parent-child feeding partnership and result in positive feeding behaviour and social development. Responsive feeding is associated with optimal nutrient intake, improved growth standards and long-term regulation of under- and overweight. Caregivers should therefore aim to make mealtimes an enjoyable experience, model enjoyment of a varied, nutritious diet, and feed responsively to a child's expressed needs.[41,54,58]

1.6.1.4 Guideline 4: "Keep on breastfeeding your baby"

The WHO recommends EBF up to 6 months of age. At 6 months, nutritionally adequate and safe complementary foods should be introduced, while breastfeeding continues for up to 2 years or beyond. The term 'exclusive breastfeeding' (EBF) is defined as the sole provision of breast milk without any other liquid or solid. Previously, the optimal duration of EBF was considered a debatable dilemma. At present, it is accepted that the unique formulation of breast milk meets the needs of infants and children for optimal growth and development and hosts other health and socio-economic benefits. There is sufficient evidence to support the universal recommendation of EBF for the first 6 months of life.[59]

Breast milk promotes sensory and cognitive development and protects the infant against infectious and chronic diseases through its nutritional and immunological benefits. Breastfeeding reduces infant mortality due to common childhood illnesses, such as gastrointestinal infections, respiratory disease and pneumonia, and helps infants to recover more quickly during illness. These effects can benefit both poor and wealthy societies, and can be enhanced with greater duration and exclusivity of breastfeeding.[60]

A systematic review by Kramer and Kakuma in 2002,[61] which included studies from both developed and developing countries, identified that infants who were exclusively breastfed for 6 months did not present with deficits in weight or length growth. It was recognised, however, that in developing countries EBF for 6 months without iron supplementation might increase the risk of iron deficiency where the newborn's iron stores may be suboptimal when the breastfeeding mother is not well nourished. However, this can be rectified with a non-nutrition intervention i.e. delayed cord clamping at birth and shortfalls are believed to be met by the infant's endogenous stores that are deposited during the antenatal period.[47,62] Furthermore, iron-deficiency anaemia is reported to be rare in the first year of life for EBF children.[62] Nevertheless, in South Africa, where the maternal rates of iron deficiency anaemia are high (between 25% and 50%), the DOH introduced a policy for routine iron supplementation for all pregnant women and the IMCI guidelines further make provision for iron supplementation for deficiency in infants. The DOH has also made provision for vitamin A supplementation along with the national food fortification programme[38] (see Sections 1.4.1 and 1.4.4).[60]

The review by Kramer and Kakuma[61] also revealed that infants who continue EBF for 6 months appear to have a lower risk of developing gastrointestinal and respiratory

infections. EBF further holds benefits for the mother with more rapid postpartum weight loss, delayed resumption of menses and delayed fertility. The latter could increase birth intervals, as frequent births may adversely affect the mother's nutritional status. The review concluded that available evidence demonstrates no apparent risks in recommending EBF for the first 6 months of life.

Diarrhoeal disease is one of the major causes of childhood deaths. Infants and children are more susceptible to gastro-intestinal disease due to their immature immune systems and developing gastrointestinal tracts. In South Africa, diarrhoeal disease accounts for up to 16% of deaths in children under the age of 4 years. Poor hygiene practices and inadequate sanitation, especially in less affluent areas, may increase the risk of developing diarrhoeal disease.[63] The relative risk of diseases including diarrhoea, pneumonia, morbidity and mortality were increased with inappropriate breastfeeding practices, when other liquids and foods were introduced before 6 months of age.[14] Deaths due to diarrhoeal disease are preventable. Appropriate and hygienic feeding practices during infancy, including EBF for the first 6 months of life, may not only improve an infant's immune system, but it will also limit their exposure to food-borne organisms and contribute to the prevention of diseases.[14,47]

In another WHO review (2002), Butte et al [62] analysed the nutritional adequacy of breast milk as a sole source of nutrition for the first 6 months. They concluded the healthy infant's nutritional requirements could be met by breast milk alone, providing the mother is well nourished.

In South Africa, the initiation of breastfeeding may be high, at around 90%, however, only 7.4% of infants are EBF for the first 6 months, 75.1% of babies are breastfed, but not exclusively and 17.5% are never breastfed. Only 6% of babies are breastfed beyond 12 months. Semi-solid foods are introduced at an inappropriate age in the majority of cases.[47]

With ample motivation and the active promotion of exclusive and continued breastfeeding, appropriate breastfeeding and complementary practices can contribute to the achievement of all the MDGs.[47] The continuous concern of malnutrition along with poor breastfeeding rates in South Africa has led to increased attention towards the promotion and support of breastfeeding guidelines and programmes[38,47] (see Section 1.4.4). In 2000, the DOH

adopted the international breastfeeding guidelines for exclusive and extended breastfeeding, and later implemented the BFHI strategy (see Section 1.4.4), now known as the MBFI.[41] Furthermore, in 2011, the Tshwane Declaration for Support of Breastfeeding[64] was approved and signed by the Minister of Health at the National Breastfeeding Consultative Meeting. This symbolises the commitment of political will at the highest level, as well as dedication by all stakeholders in South Africa, to work together to promote, protect and support breastfeeding.

It now remains a priority to implement these guidelines in child-related feeding programmes, including the PFBDGs, and to effectively evaluate and monitor the implementation of breastfeeding at all stages.[47,60]

1.6.1.5 Guideline 5: "Offer your baby clean, safe water regularly"

Poor water quality due to water scarcity and lack of access to clean water in households in developing countries such as South Africa has been recognised to increase the risk of infectious diseases, including diarrhoea. Harmful bacteria, viruses and parasites could contaminate water at the source and unhygienic handling of water during transport or within the home can contaminate previously safe water.[65] It has been identified that the highest incidence rate of infectious diseases caused by poor drinking water quality is often found in small infants. Infants are generally more prone to food- and waterborne diseases due to their immature immune systems and developing gastrointestinal tracts. Moreover, during infancy, babies are introduced to complementary foods and the intake of breast milk declines. As a result, the provision of antibodies via breast milk is reduced and the risk of infections increases.[66] The implementation of guidelines to promote safe water storage and effective low-cost household water treatment including the use of solar disinfection, treatment with a bleach solution and boiling, all of which are effective methods to improve water quality and reduce the risk of diarrhoea.[65]

Breast milk constitutes almost 90% water, hence children and infants who are frequently breastfed generally receive sufficient fluid. Non-breastfed children and infants, however, may need to obtain fluids from other sources, especially under hot climatic conditions. These fluids can be incorporated into foods, but plain, clean (boiled, if necessary) water is less likely to support bacterial growth and it should be offered frequently to ensure that the child is receiving sufficient fluid.[67]

1.6.1.6 Guideline 6: "Teach your baby to drink from a cup"

By the time they are 6 months old infants should start to learn how to drink from an open cup. Images of suitable open drinking cups for infants are shown in Figure 1.6.

Figure 1.6: Images of suitable open drinking cups for infants

Source: http://images.google.co.za.

Cup-feeding has many advantages compared to bottle-feeding:

- It is considered more hygienic. Improper cleaning and sterilising of bottles and teats, especially in poorer, rural areas may increase the risk of contamination and the development of infections.
- Prolonged bottle-feeding may lead to an increased risk of developing dental caries due to fluids pooling in the mouth.
- Bottle-feeding may interfere with oral muscle development, thereby affecting speech.
- Drinking from a cup, rather than a bottle, may prevent nipple confusion and may result in prolonged breastfeeding.[68]

1.6.1.7 Guideline 7: "Take your baby to the clinic every month"

Growth and development are monitored during clinic visits, enabling health care workers to identify, address and possibly prevent nutrition-related health issues from an early age.[10] Regular clinic visits may also increase the probability of infants receiving their full course of immunisations.

Figures from Statistics South Africa identified that in 2009 95.3% of children were fully immunised by their first birthday.[69] Children in rural areas with less educated mothers were less likely to be fully immunised. It was advised that opportunities for immunisation should be created, especially in areas of low coverage, and a health record containing information on immunisation status and other relevant health information should be implemented.[30]

The RtHC was previously implemented for regular measurement and recording of immunisation as well as weight-for-age as part of GMP at PHC facilities. In 2011, the DOH implemented the Road to Health Booklet (RtHB) for children from birth to 5 years. The new RtHB replaced the previous RtHC to enable health workers to assess children's health and growth more comprehensively. The booklet incorporated the WHO Child Growth Standards (see Figure 1.7), based on children who received EBF and appropriate complementary feeding in an optimal paediatric health care and health-promoting environment. These growth standards were developed using a more representative reference population of children and are considered to be globally more applicable and relevant.[36,44] The previous growth charts used in the RtHC were developed by the US National Centre for Health Statistics and were largely based on infants receiving breast milk replacement formula from one ethnic group in one county. Furthermore, the growth standards in the new South African RtHB do not only focus on weight-for-age, but also height-for-age and weight-for-height, thereby enabling health care workers to identify and address the risk of stunting. Additionally, the RtHB contains health promotion messages, including the definition and promotion of EBF and appropriate introduction of complementary feeding as encompassed in the both preliminary and revised PFBDGs. The RtHB is therefore and important educational tool that can be used at all levels of health care to assist with the realisation of alleviating childhood malnutrition. Health care workers should be trained and encouraged to use the booklet correctly, and the contained messages should be reviewed regularly to ensure they correspond with the most recent PFBDGs.[47]

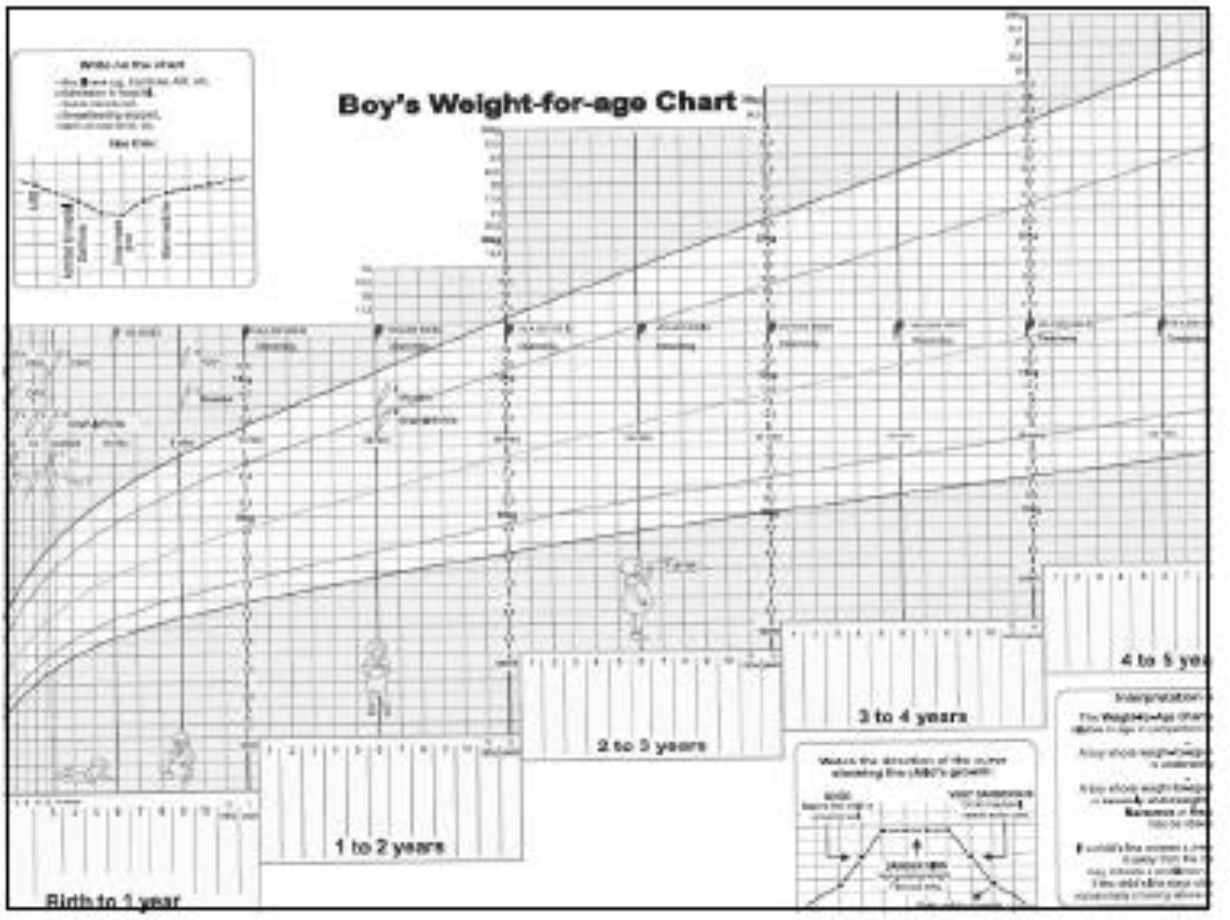


Figure 1.7: WHO child growth chart incorporated in the RtHB[44]

1.6.2 Focus group discussions as a method of consumer testing

The WHO/FAO expert panel recommended the use of focus group discussions (FGDs) to test the appropriateness and cultural acceptability of the FBDGs amongst the public. They suggested that focus groups should comprise between eight and fifteen people and sufficient groups should be consulted to yield a fair representation of the population by geographical area, religion and education.[6] Based on their recommendation, the current study utilised FGDs to assess the comprehension of the preliminary PFBDGs as well as gathering insights into the perceptions, attitudes and appropriateness thereof.

FGDs is a qualitative research method commonly used to bring together people of similar backgrounds and experiences to participate in a group discussion about major issues that affect them. FGDs usually involve open-ended interviews lasting between 60 and 90 minutes with groups of five to eight people guided by a facilitator. The purpose is to gain insight into participants' attitudes and perceptions about a matter and is often used for

assessing health education messages and public understanding of health matters.[70–72] Although group interviews may be a quick and convenient way of collecting data from a group of people simultaneously, FGDs are explicitly used as a research method to encourage participants to interact and talk openly to each other. Group discussions may help people to explore and clarify their views in a way that may be less accessible during a one-to-one interview. It enables the investigator to observe many different forms of communication, including nonverbal cues and expressions. Examining group interactions such as laughter, argument, narratives used, etc. helps the researcher to identify shared and common knowledge and is therefore a useful method for assessing cultural differences and opinions.[71,72]

FGDs further have the advantage of encouraging the participation of people who are reluctant to be interviewed on their own or those who feel they have nothing to say. FGDs do not discriminate against people who cannot read or write.[72] In contrast, peer pressure in groups may prevent people from raising their own opinions and dominating participants may lead the discussion. It is the responsibility of the facilitator to control participants and direct the discussion, without influencing the conversation.[70,71]

Purposive selection of participants is typically used as the desirable sampling method for qualitative research studies.[70] Theoretically, the sample size for a qualitative study is unlimited and discussion groups will continue until no more new information is gathered, i.e. when a point of saturation is reached.[70,71] Supported by the literature, the WHO/FAO report suggests that testing the FBDGs did not require scientific sampling, and three focus groups per region might be sufficient to represent the target population and gather the necessary information.[6]

This study therefore identified three suitable clinics in each of the two selected geographical areas where FGDs could be performed. Further detail regarding the methods of sample selection and data collection will be discussed in Chapter 2.

1.7 CONCLUDING STATEMENT ON LITERATURE REVIEW

Malnutrition is a worldwide problem [6,9,30–32] and without addressing the problem it can lead to serious health consequences.[19,22–24] Numerous nutrient-related guidelines and nutrition programmes have previously been implemented to address the situation, however, it was

recognised that FBDGs may better address diet-related health issues because consumers think in terms of food rather than nutrients. The WHO/FAO therefore initiated investigations and suggested the implementation of FBDGs to be used as an education tool in primary care facilities. They further suggested consumer testing to evaluate the comprehension and cultural applicability prior to the release of local FBDGs. FGDs were recommended as the most appropriate method to assess a population's understanding of the guidelines.[6]

The process of developing FBDGs in South Africa was initiated by the NSSA in 1997. After an extensive process of development and consumer testing, a set of FBDGs for adults and children older than 7 years was adopted by the DOH in 2003.[9] During the process, it was identified that a separate set of paediatric FBDGs was needed. Consumer testing of the South African preliminary PFBDGs has been undertaken since 2000.[11–13] Additional testing was required to ensure representation from the diverse South African population.

The present study aimed to contribute to the process of testing local PFBDGs by assessing the comprehension and applicability of the 2007 preliminary PFBDGs for a specific language and socio-cultural group in this critical age category that has not yet been assessed. Northern Sotho is one of South Africa's official languages and the fourth most common home language, spoken by a large proportion of the Gauteng population. The PFBDGs have not been tested in Gauteng. The vulnerable group of 6–12-month-old infants and their mothers/caregivers, of the Northern Sotho community were consequently identified as a suitable study group. The study protocol was composed during 2011 and 2012 and fieldwork was performed in 2013, prior to the release of the proposed PFBDGs in December 2013. Although the review and discussion of this report is focused on the first preliminary set of PFBDGs of 2007, the information that emerged from this research process could also provide valuable insights into future evaluation of the 2013 revised set of the South African PFBDGs.

1.8 PROBLEM STATEMENT AND MOTIVATION FOR THIS STUDY

This study originated from previous consumer assessments of the preliminary PFBDGs in South Africa. Previous assessments were limited mainly to the Western Cape region, representing only a fraction of the diverse South African population.[11–13] The requirement developed to facilitate the consumer testing of the South African preliminary PFBDGs

within an age category and a geographical area that has not yet been assessed. Gauteng is considered the economic capital of South Africa and accommodates a large percentage of the total population.[73] None of the previous consumer assessments aimed at testing the PFBDGs amongst this substantial population group and the need emerged to perform a consumer test to represent this group. Gauteng covers a large geographical area, and it was only practical to concentrate on a small, but densely populated region within the province such as the urban settlement in the north western region. Although Gauteng often accommodates immigrants from other areas, Northern Sotho is the mother-tongue and original language most commonly spoken in the northern regions of the province.[73] The age category 6–12 months is considered a critical window for growth and development.[41] Consequently, this study consisted of mothers and caregivers attending selected PHC clinics with their Northern Sotho infants aged 6–12 months and focused on two small, but densely populated urban towns, Soshanguve and Ga-Rankuwa. PHC clinics were purposively selected to prevent bias and ensure homogenous groups.

The findings from previous FBDGs assessments and the development of the new South African Food Guide, have resulted in the revised set of FBDGs for adults and children.[7] Further consumer testing is required to incorporate more cultural groups and ensure the final set of FBDGs are appropriate for the diverse South African population and compatible with the new Food Guide. Findings from this study may contribute to the revision of the messages and assist with the development of an appropriate final set of PFBDGs that can ultimately be tested and implemented as an effective nutrition education tool.

1.9 CONCEPTUAL FRAMEWORK

The conceptual framework provides a schematic overview of this study, illustrating the inputs, influential factors and outcomes on which the study results are based (Figure 1.8).

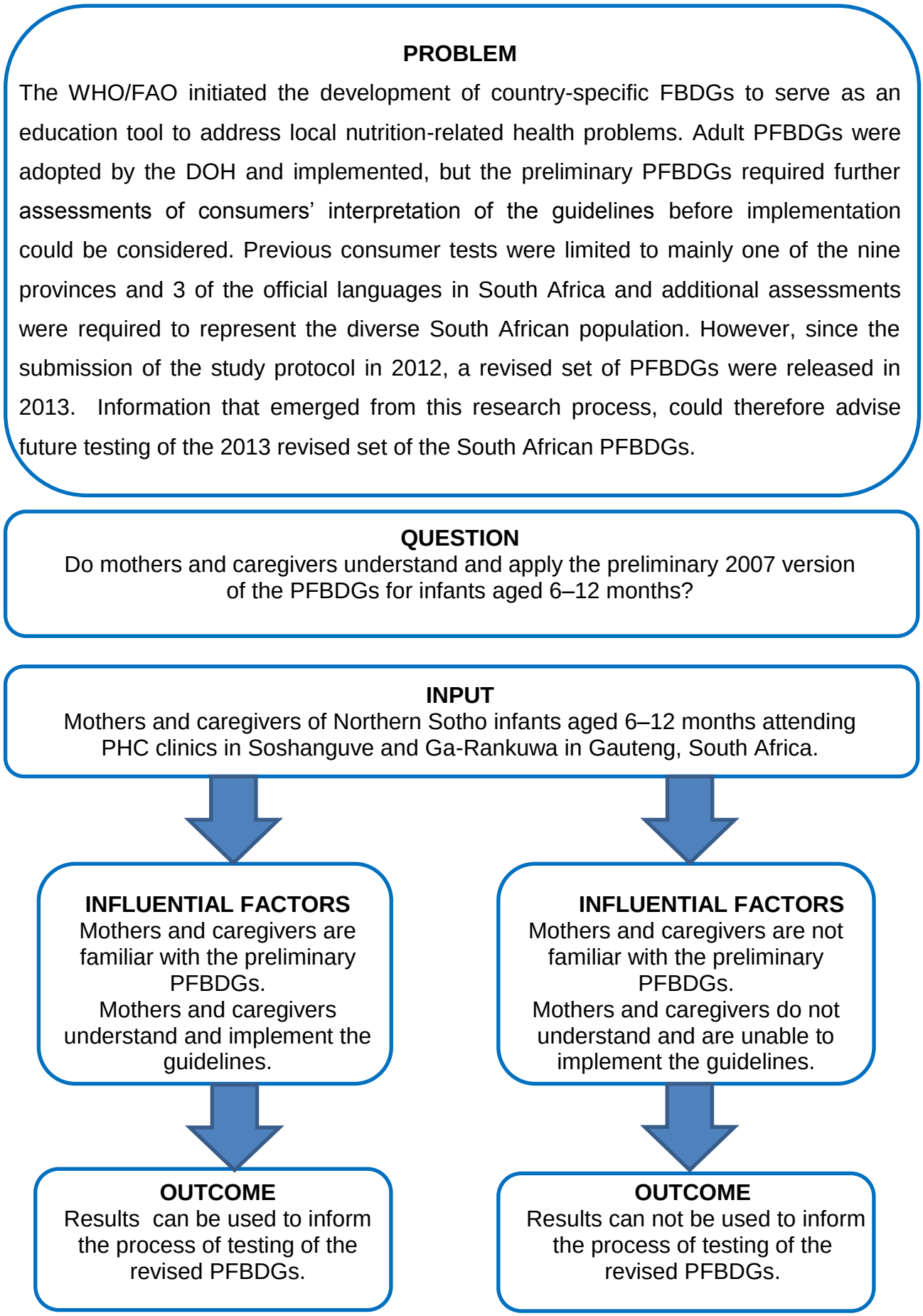


Figure 1.8: Conceptual framework of this study

CHAPTER 2

OBJECTIVES AND METHODOLOGY

2.1 INTRODUCTION

This study emanated from previous consumer tests and aimed to assess the understanding of the South African preliminary 2007 version of the PFBDGs for healthy infants aged 6–12 months. There was the requirement for consumer testing of the preliminary PFBDGs among various population groups in South Africa and there was a particular need to expand the consumer testing to a group that had not yet been assessed. Northern Sotho is one of South Africa's official languages and commonly spoken in Gauteng. The PFBDGs have not been tested in Gauteng province. The mothers/caregivers of 6–12-month-old infants, of the Northern Sotho community were therefore identified as a suitable study group.

This chapter includes descriptions of the following: aim and objectives, study design, study population and sampling, data collection and analysis, and a pilot study that was carried out.

2.2 STUDY AIM AND OBJECTIVES

2.2.1 Aim of the study

The aim of the study was to assess the comprehension and applicability of the South African preliminary 2007 version of the PFBDGs for the mothers and caregivers of healthy Northern Sotho infants aged 6–12 months who reside in Soshanguve and Ga-Rankuwa.

2.2.2 Research objectives

2.2.2.1 Main objective

To determine whether the mothers and caregivers of Northern Sotho infants attending a PHC clinic in Soshanguve and Ga-Rankuwa are aware of the preliminary PFBDGs for infants aged 6–12 months and whether they

understand these guidelines, find them culturally acceptable and are able to apply them in practice.

2.2.2.2 Specific objectives

- To determine whether participants had previously been exposed to each of the preliminary PFBDGs for infants aged 6–12 months.
- To determine whether participants understood each guideline and how they interpreted the meaning thereof.
- To determine whether participants accepted each guideline within their social and cultural environment.
- To determine whether participants practically applied these guidelines when feeding their infants.
- To assess the socio-demographic circumstances of the participants and discuss the possible influence of this in the context of their understanding and application of the guidelines.
- To make recommendations for the revision and implementation of PFBDGs for infants aged 6–12 months to the PFBDG Working Group based on the outcome of the study.

The objectives were implemented by asking participants questions and encouraging discussion thereof. Participants were asked if they had ever heard about each of the guidelines, where they had heard about them, what the concept and terminology meant to them, whether the guidelines were acceptable within their cultural and social context, and how they applied them. They were finally asked to make recommendations on how to change each guideline in order to improve the comprehension and acceptance thereof.

In addition, socio-demographic data were collected by means of a socio-demographic questionnaire. Variables included age, gender, living conditions and socio-economic status. An association between poverty and ill health has been demonstrated for a wide range of health outcomes. Considering the diverse society of South Africa, researchers are challenged to critically consider the effects that social and economic factors may have on community-based research outcomes.[70] Measuring the socio-demographic status therefore adds an invaluable dimension to the study and may contribute to explaining the participants' understanding and implementation of the PFBDGs.

2.3 STUDY DESIGN

The study was based on the recommendation of the WHO/FAO report on the preparation and use of food-based dietary guidelines.[6] An observational, cross-sectional design incorporating both qualitative and quantitative research methods was used. This permitted both descriptive and statistical analyses of the data. The qualitative aspects of this study utilised FGDs to assess the comprehension of the PFBDGs as well as gathering insights into the perceptions, attitudes and appropriateness thereof.

Alongside this qualitative approach, quantitative data regarding the socio-demographic profiles of participants were collected by means of a self-administered questionnaire.

2.4 STUDY POPULATION AND SAMPLING

2.4.1 Study population

The study population comprised Northern Sotho mothers and caregivers attending selected PHC clinics with their infants aged 6–12 months. It focused on two small but densely populated urban towns, Soshanguve and Ga-Rankuwa (Figure 2.1).

Figure 2.1: Images of Soshanguve town and shopping mall

Source: http://images.google.co.za.

Soshanguve and Ga-Rankuwa lie respectively in the eastern and southern areas of the north western district of Tshwane, Pretoria, in the Gauteng province of South Africa (see Figures 2.2, 2.3 and 2.4).

Figure 2.2 A map of South Africa, indicating the location of Gauteng province

Source: http://images.google.co.za.

Figure 2.3 A map of Gauteng province

Source: http://images.google.co.za.

Figure 2.4 Tshwane municipal area including Soshanguve and Ga-Rankuwa

Source: http://www.sleeping-out.co.za/Tshwane-Map.asp.

2.4.1.1 Description of study population

Gauteng is the smallest and most densely populated of the nine provinces in South Africa, and generally regarded as the economic powerhouse of Africa. It has a mild to warm climate, making it a sought-after residential area. Tshwane is one of the two municipalities of north Gauteng. The City of Tshwane Municipality covers a total area of 2195 km^2. It is divided in five regions: the north eastern, north western, southern and eastern regions and the central west.[74,75]

Northern Sotho is the most common language in Tshwane; it is spoken by almost 45 000 (2009 data) people (9% of the population). The Northern Sotho people are mainly resident in the north eastern and north western districts of Tshwane. These areas are highly populated: 33% of the Tshwane population reside in the north western region and 14% in the north east. The north western region is more heavily populated and economically active than the north east. However, these areas are still the poorest in Tshwane, with unemployment figures of between 45.1% and 60.9% of the total population (Figure 2.5).[73]

Figure 2.5: Typical modest dwellings in Soshanguve and Ga-Rankuwa

Source: http://images.google.co.za.

PHC clinics were chosen as an access point to reach the target group. PHC facilities are often the first point of contact with health care systems and an important source of health information and education to the public.[38] It is important that health care messages at these facilities, including nutrition education and FBDGs, are consistent and appropriate. PHC clinics in South Africa are government owned and their services are available to users at no cost. About 64% of the population is entirely dependent on public health services (PHS). Around 21% of the population use the private sector mainly for primary level care, but depend on the public sector for hospital care. The remaining 15% belong to private medical schemes and do not make use of PHS. Due to South Africa's political history of apartheid, health services still suffer the consequences of health inequities. Although progress has been made in redistributing the provision of health services, continuous improvement has been constrained by factors such as inadequate human and financial resources, poor planning and management, and an increased strain on the public health system caused by the AIDS epidemic. Lower socio-economic groups who depend entirely on PHS may still be at risk of receiving inadequate health care, while communities that are more affluent make use of private health care to obtain optimal medical treatment.[76]

2.4.2 Sample selection and size

2.4.2.1 Purposive selection of primary health care clinics

The WHO/FAO report on the preparation and use of food-based dietary guidelines[6] suggested that consumer testing of the FBDGs did not require a scientific random sampling method and three focus groups per region might suffice to gather sufficient information. Non-random, purposive sampling was consequently used to select three PHC clinics in each geographical area under consideration, i.e. three in Soshanguve and three in Ga-Rankuwa. Theoretically, the sample size for a qualitative study is unlimited and discussion groups will continue until no more new information can be elicited.[70,71] It was therefore envisaged that more FGDs might be required until a saturation point was reached. The investigator planned to review the need for further discussion groups at alternative clinics towards the end of the anticipated data collection process.

The selection of PHC clinics was based on accessibility for the investigator and the public, attendance by the public and hosting of a baby clinic. A large community health centre (CHC) and two smaller district clinics from each of the selected geographical areas were included, to represent a range of the population. There are six large CHCs situated in the main towns of the Tshwane municipal area. A CHC is a government-owned facility that offers a comprehensive medical service to a large catchment population. Smaller district clinics are also government owned and situated inside the villages. They offer basic PHC such as counselling, nutrition advice, support groups, immunisation, ARV and TB treatment to a smaller catchment population.[77]

The purposive selection of suitable PHC clinics was made with the assistance of and advice from the Department of Health and Social Development, Tshwane District and Clinic Managers at the CHCs in Soshanguve and Ga-Rankuwa. A map and contact details of PHC facilities in Tshwane was provided by the Department of Health and Social Development, Tshwane District and used to locate clinics. Focus groups planned for each geographical area and clinic type are shown in Table 2.1.

Table 2.1: Focus groups planned for each geographical area and clinic type[78]

	Clinic name	Geographical area	Type of clinic	Catchment population
Clinic A	Soshanguve CHC	Soshanguve	CHC	123 011
Clinic B	Soshanguve Clinic 2	Soshanguve	Public community clinic	36 587
Clinic C	Soshanguve Clinic 1; Maria Rantho	Soshanguve	Public community clinic	58 412
Clinic D	Ga-Rankuwa CHC	Ga-Rankuwa	CHC	61 711
Clinic E	Ga-Rankuwa Phedisong 6	Ga-Rankuwa	Public community clinic	11 350
Clinic F	Ga-Rankuwa View	Ga-Rankuwa	Public community clinic	Unknown

2.4.2.2 Sample selection of participants

Non-random sampling is generally not used for quantitative studies because the level of representativeness is questionable and, consequently, generalisation about the study population cannot be made.[70] However, in some situations, and especially for qualitative research, non-random sampling may be the desirable method to locate specific target groups. For example, for the formation of focus groups, purposive selection of participants is required to select 'typical' individuals that are relevant to the study aims. Non-random purposive sampling was therefore used to select mothers and caregivers with Northern Sotho infants aged 6–12 months who attended the selected PHC clinics at the time of the study.

The WHO/FAO report suggests that focus groups should comprise between eight and fifteen and a sufficient number of groups should be consulted to yield a fair representation of the population by geographical area, religion and education.[6] Literature also suggests group sizes of between six and ten members,[70] or even groups as small as four to six people, especially for novice researchers.[72] Based on these recommendations, this study aimed at recruiting at least four people for each discussion group, with a maximum of ten people.

2.4.2.3 Inclusion criteria

PHC clinics:

- Accessible PHC clinics hosting a baby clinic and therefore regularly attended by mothers and caregivers of infants.
- PHC clinics located in Soshanguve or Ga-Rankuwa.
- PHC clinics owned by the government.

Participants:

- Members of the public whose mother tongue was Northern Sotho and who attended a selected PHC clinic with their infants aged 6–12 months at the time of the study.
- The person who attended the clinic with their baby and who was willing to participate in the study had to be the mother and/or the main caregiver of the infant.
- The person who attended the clinic with the baby was considered to be the main caregiver if they took care of the baby for at least 5 daylight hours per day on at least 5 days per week.
- Only those who met the inclusion criteria and agreed to sign the informed consent form (Addendum 1) were included in the study.
- An infant was considered as being Northern Sotho if the first language spoken by the mother of the infant was Northern Sotho, Sepedi or Tswana.

Northern Sotho, also known as Sesotho sa Leboa, is one of South Africa's official languages. It is South Africa's fourth most common home language, spoken by 9.1% of the population. It is the language of the Limpopo province (north of Gauteng), where it is spoken by more than half of the provincial population. It is also spoken in Gauteng, especially in the northern parts bordering Limpopo, where nearly a third of Northern Sotho speakers are to be found, comprising 10,5% of the population. Sepedi is a dialect of Northern Sotho.[74,75,79]

The language of Setswana/Tswana is largely found in North West (the province to the west of Gauteng) and is South Africa's sixth most common home language, spoken by 8% of the population. It is also spoken in Gauteng, where 9,1% of the population speak Tswana as a home language.[74,75,79]

Although Northern Sotho and Setswana are identified as separate official languages, they are closely related and largely mutually intelligible. Modern language communities in South Africa (including the Northern Sotho language community) are typically constituted by a variety of groups with differing socio-cultural identities, speaking a diversity of social and geographical dialects. In the selected study area, the culture and language of Northern Sotho, its Sepedi dialect and Tswana are so similar that the people themselves find it difficult to draw any real boundaries between them.[79] For this reason, people speaking Northern Sotho, Sepedi and Tswana were included in the study population under the umbrella term 'Northern Sotho'.

2.4.2.4 Exclusion criteria

Clinics:

- Inaccessible PHC clinics that may put the safety of the investigator at risk during travelling and clinic attendance.
- PHC clinics located outside of Soshanguve or Ga-Rankuwa.
- Privately owned clinics or health care facilities.
- Secondary and tertiary health care facilities.

Participants:

- Subjects refusing consent, or who were unwilling to participate in the FGDs.
- Mothers or caregivers who do not speak Northern Sotho, Sepedi or Tswana as their first language.
- Mothers or caregivers attending the PHC with an infant younger than 6 months or older than 12 months.
- Subjects attending the clinic with the infant, but who were not the mother or main caregiver.

2.5 DATA COLLECTION METHODS

The investigator approached the DOH, Tshwane Research Committee, and obtained written consent in January 2013 to perform the study in the selected geographical area (Addendum 2). The study was performed over a period of 11 weeks between 30 April 2013 and 16 July 2013. One FGD was held approximately every fortnight. The investigator visited the allocated clinics in March 2013 and met with clinic managers to arrange appropriate dates, times and suitable rooms to perform the FGDs. Two weeks prior to each FGD, the investigator met with clinic staff to confirm the session and allocate an appropriate staff member to assist with translation during each FGD. Posters (printed in Northern Sotho) (Addendum 3) were then displayed in the clinic where the FGD would be performed and leaflets (in Northern Sotho) (Addendum 3) were left at the reception for distribution to all clinic attendees. The aim of the posters and leaflets was to inform the public about the research study and invite them to participate.

On the day of the FGDs, the investigator arrived at the selected PHC clinic and, with the assistance of clinic staff, recruited suitable candidates. In each of the clinics, the investigator approached the attendees in the waiting area where the baby clinics were

hosted. The aim of the study was briefly explained to all attendees, then mothers/caregivers who met the inclusion criteria (i.e. attending with a Northern Sotho infant aged 6–12 months) were invited to participate. Only clinic attendants who met the inclusion criteria and agreed to participate were selected. Prior to each FGD, the participant information leaflet and consent form (Addendum 1) was read out aloud in Northern Sotho by a volunteering participant under the supervision of the investigator. The consent form was previously reviewed by a speech-and-language therapist to ensure the language was understandable and on a grade 8 level. All participants were asked to complete the consent form, printed in Northern Sotho, and the socio-demographic questionnaire preceding the FGD. The investigator assisted with the completion where needed. Subjects who refused consent and/or were unwilling to participate in the FGD were excluded from the study.

2.5.1 Collecting quantitative data

A questionnaire (Addendum 4) was used to collect quantitative data regarding participants' socio-demographic characteristics. The socio-demographic questionnaire was completed by each participant prior to the FGD. The questionnaire was designed to enable both literate and illiterate respondents to participate. Literate respondents completed the questionnaires without assistance. The investigator supported illiterate participants and others who needed assistance with the completion of the questionnaire.

The questionnaire included 21 questions and the variables were related to:

- The infant's age, home language and place of residence. (Questions 1–3). Questions 1–3 were used to ensure that participants met the inclusion criteria. Those who did not meet the criteria were excluded from the study.
- Personal background: The carergiver's age, gender, number of children, marital status and connection to the baby brought to clinic (Questions 4–8).
- Educational status (Question 9).
- Employment and occupation: Occupation and monthly income of household members (Questions 10–13).
- Housing: The type and size of dwelling and the number of people accommodated by the dwelling (Questions 14–16).
- Water and sanitation: Water provision and toilet facilities for the household (Questions 17 & 18).

- Energy/fuel: Type of energy/fuel the household used for cooking and lighting (Questions 19 & 20).
- Household goods: Appliances and facilities, including postal, internet and telephone services available to the household (Question 21).

Questions and categories of the socio-demographic questionnaire were based on the Statistics South Africa, Community Survey 2007[80] to ensure they were appropriate for the selected community. Many of the variables coincide with those used in previous studies in which the preliminary FBDGs for South African children were tested.[11–13] By measuring the same variables, a set of comparable data was captured that could be used in future studies.

Questions 2, 3 and 11, pertaining to the home language of the mother/caregiver, the town/village where they lived and the occupation of household members were open-ended questions. The remaining questions were closed-ended. The majority of these variables can be described as nominal, categorical variables of a qualitative nature, except for questions 9 and 12, which are ordinal, categorical of a quantitative nature. The variables indicating the age of the carer, the number of children of the carer, the number of rooms of the dwelling and the number of people living in the dwelling (questions 4, 7, 15 and 16, respectively) are discrete numerical variables also of a quantitative nature (see Table 2.2).[70]

Table 2.2 Description of questions and variables in socio-demographic questionnaire

	Question number	Open-ended	Closed-ended	Qualitative nominal categorical	Quantitative ordinal categorical	Quantitative discreet numerical
SECTION A: Inclusion criteria	Q 1		✓	✓		
	Q 2 & 3	✓		✓		
SECTION B: Personal background	Q 4 & 7		✓			✓
	Q 5 & 6 & 8		✓	✓		
SECTION C: Education	Q 9		✓		✓	
SECTION D: Employment & occupation	Q 10 & 13		✓	✓		
	Q 11	✓		✓		
	Q 12		✓		✓	
SECTION E: Housing	Q 14		✓	✓		
	Q 15 & 16		✓			✓
SECTION F: Water & sanitation	Q 17 & 18		✓	✓		
SECTION G: Energy & fuel	Q 19 & 20		✓	✓		
SECTION F: Household goods	Q 21		✓	✓		

2.5.2 Collecting qualitative data

FGDs were used to collect qualitative data regarding the comprehension of the PFBDGs. The aim of the FGDs in this study was to obtain relevant information regarding the comprehensibility of the PFBDGs, i.e. exposure, interpretation, cultural acceptability and practical application.

The investigator facilitated all the FGDs. A set of predetermined probing questions (Addendum 5) was used to guide the discussion and ensure that information regarding the exposure, interpretation, cultural acceptability and practical application of each of the PFBDG was collected. The results of previous FBDGs studies[10–13] with a similar design were used to compose the probing questions for the data capture sheet.

It was initially planned that the investigator would appoint Northern-Sotho-speaking health care workers to assist with the recruitment of participants, and the interpretation, observation and record keeping of FGDs throughout the project. However, due to staff

shortages, nobody was available to assist with the entire study. As an alternative, and with the approval of the Health Research Ethics Committee at Stellenbosch University, the investigator performed each FGD in English and arranged at each clinic to call for the assistance of an allocated clinic staff member when needed. The participants were informed about this arrangement prior to each session and were asked to indicate when they needed the assistance of an interpreter. The selected geographical regions are well developed, metropolitan areas and English is well understood by the majority of the population. Subsequently, most of the participants preferred to continue in English without the assistance of an interpreter. An interpreter was used for only one of the FGDs.

Focus groups were homogenous and included only mothers and caregivers of Northern Sotho infants aged 6–12 months. Each FGD was held in a relatively quiet space or private room and lasted between 40 and 70 minutes. In all but one of the clinics, a private room was available for the FGDs; however, in one clinic all rooms were occupied and the investigator was forced to conduct a FGD in a hallway. Discussions followed a similar flow of events, including an introduction, the provision of an overview of the topic, reasons for the research project and the assurance that information would be treated with confidence. This was followed by the discussion and closing (according to guidelines in Addendum 6). Flash cards of the guideline under discussion, printed in English, (Addendum 7) and models to determine appropriate food quantities, textures and feeding cups were used during each discussion. Models only served as a tool to avoid ambiguous responses for Guideline 2 and Guideline 6 when participants were asked to indicate appropriate options.

The discussion of Guideline 2 was accompanied by models to illustrate suitable textures and quantities for a 6-month-old baby. Two tubs containing food with a smooth or a lumpy texture and common household utensils were presented to demonstrate possible food volumes and textures (see Figure 2.6).

For Guideline 6, a baby feeding cup with and without a spout, an ordinary cup and a baby bottle were used to determine what was considered as being a suitable feeding cup for an infant (see Figure 2.7). Prior to presenting the models for Guideline 6, participants were first asked what they perceived as a suitable feeding cup so as not to affect their individual perceptions. Models were then used to confirm their descriptions.

Figure 2.6: Models used to identify food textures (left) and quantities (right)

Figure 2.7: Models used to identify possible feeding 'cups'

The investigator used the data capture sheet (Addendum 5) for making brief notes on what was said, as well as the body language and social processes of participants, e.g. nonverbal apparent confusion, enthusiasm or lack of interest. Both voice and video recordings were made for each FGD, using a freestanding video recorder and digital voice recorder. Consent to be videoed and voice-recorded was sought from all participants prior to each FGD. Refreshments that included juice and biscuits were provided after each meeting.

2.6 TESTING VALIDITY AND RELIABILITY OF RESEARCH INSTRUMENTS

2.6.1 Validity

In epidemiological research, validity refers to the accuracy of the assessment, i.e. how close the study finding comes to the truth and whether the instrument measures what it is

intended to measure. The focus is therefore on the instrument and that it must be applied in a standardised manner according to prescribed procedures.[70,71] In this study, two instruments were used to collect data: the socio-demographic questionnaire and the investigator who facilitated the FGDs. Certain procedures were incorporated during the planning stages of the study and the development of instruments to improve the quality of the results.

2.6.1.1 Validity of quantitative data

The following concepts were considered during the development of the socio-demographic questionnaire (Addendum 4) in order to improve the validity of the results:

- **Face validity:** The extent to which the questions make sense to those knowledgeable of the subject or to the interviewers familiar with the language and culture of the participants, i.e. does the investigator subjectively agree that the questions are understandable and that the questionnaire measures the socio-demographic characteristics of participants:[70]

  Standardised questions and categories from the Statistics South Africa, Community Survey 2007, Household Questionnaire[80] were used in developing the questionnaire. It was expected that these questions and categories were tested and used in similar communities to determine their socio-demographic characteristics and would therefore be applicable to the study population. However, the questionnaire was tested by the investigator during a pilot study (discussed in Section 2.9) to ensure questions were understandable and applicable to the cultural group. Considering the group's appropriate responses, the investigator believed that the participants understood the questions.

- **Content validity**: The extent to which a measure represents all facets of a given concept, i.e. ensuring that all the socio-demographic characteristics of the population are accounted for:[70]

  During the development of the socio-demographic questionnaire, all the variables in the standardised Statistics South Africa, Community Survey 2007, Household Questionnaire[80] and the City of Tshwane, Tshwane Metropolitan Profile[73] were used to account for socio-demographic characteristics of the participants.

Collected raw data was checked and cleaned prior to analysis to identify possible errors and missing data. The elimination of errors is required to reduce bias, thereby improving the validity of the results.[70]

2.6.1.2 Validity of qualitative data

In qualitative research, the investigator is the instrument and hence research methods are particularly prone to researcher subjectivity and bias. The credibility of qualitative methods depends largely on the skill, competence and rigor of the person/s doing the fieldwork. Validation for qualitative research therefore focuses on procedures for minimising investigator bias.[70,71]

Triangulation is a technique that can be used to verify results obtained by qualitative measures. This method implies that the results obtained by multiple observers, theories, methods or data sources are compared to see if they complement each other, with the intention to minimise possible bias that comes from single methods, observers and theories.[71] Triangulation, as described by Flick et al,[81] is a term used to refer to the observation of the research issue from at least two different perspectives. Although this is most often performed by applying different methodological approaches, new perspectives in the triangulation of data are emerging. Visual data, including video recordings and photos, are currently receiving considerable attention in improving the quality of qualitative research. Visual data could be triangulated with verbal data (including interviews and group discussions) as an independent source of information and may be classified as a method of triangulation of qualitative data sources.

It was originally planned to appoint independent health care workers to assist with the recruitment of participants, and interpretation and record keeping of FGDs, and another to undertake the role of a second observer during discussions. This would have allowed for an ideal triangulation technique where the combination of interviewing, observation and documentation could have enabled cross-data consistency checks.[71] Unfortunately, due to financial and staff constraints, no health care workers were available to assist.

The validity of results for the FGDs was enhanced by triangulating the data, as described by Flick et al,[81] i.e. comparing the results of two different perspectives to ensure they complement each other.

1. The investigator facilitated each FGD and produced written notes during the discussion about what was said and nonverbal cues. A digital voice recorder was used to record each discussion and the recordings, along with the written notes were used to transcribe and analyse the data.
2. A video recording of each interview was made to capture data, nonverbal cues and body language of participants.
3. Video recordings were compared with transcribed data and similar outcomes were achieved for captured data, nonverbal cues and body language.

2.6.2 Reliability

Reliability can be defined as the degree of similarity of results when repeated measures are taken. Variations between measures may lead to poor reliability of study results. This could be decreased by addressing the source of the variation.[70]

2.6.2.1 Reliability of quantitative data

Instrument variation, i.e. using a standardised and calibrated instrument, may reduce variation in results when the instrument is repeatedly used by the same observer.[70] A standardised questionnaire taken from the Statistics South Africa, Community Survey 2007[80] was used to develop the socio-demographic questionnaire (Addendum 4) for this study, thereby improving the reliability of the results. In addition, quantitative data was collected by using the predesigned questionnaire. The investigator reviewed each questionnaire directly after completion and assisted participants in adding any missing data. Assistance in the completion of the questionnaire was also provided to those participants who were unable to complete the questionnaire themselves. Providing assistance during completion and reviewing each completed questionnaire contributed to the accuracy of quantitative data collected and thus added to the reliability of the results.

2.6.2.2 Reliability of qualitative data

Observer variation can stem from differences among observers or interviewers or from differences in the same observer on separate occasions.[70] Inter-observer variation was eliminated in this study as only one investigator performed the entire study, including data collection and analysis. Furthermore, good organisational and leadership skills were demonstrated by the investigator to ensure that each FGD proceeded in the same methodical manner, thereby reducing intra-observer variation. A data capture sheet with

probing questions (Addendum 5) that served as a preconceived framework for guiding each FGD was used to set the exact ways of directing each discussion. The results of previous FBDGs studies[10–13] with a similar design were used to compose probing questions. The investigator reviewed each data capture sheet directly after the FGD to identify possible issues concerning data collection such as missing data, incomplete or illegible entries or failure of respondents to participate. These matters were clarified and eliminated by using the video and voice recordings.

2.7 DATA ANALYSIS

2.7.1 Analysis of quantitative data

A statistician of the Department of Statistics at Stellenbosch University was approached during the planning and writing of the research protocol to approve the planned analysis procedure and continued to provide assistance during the research project. STATISTICA version 12[82] was used to analyse the quantitative data.

Following the collection of quantitative data via the socio-demographic questionnaire, the following was implemented prior to data analysis:

- Coding: Each questionnaire was coded manually, using predetermined ordinal and nominal codes on the questionnaire (Addendum 4; Table 2.2).
- Data preparation and capturing: A Microsoft Excel spreadsheet was used for capturing data (Addendum 8). Data collected via the socio-demographic questionnaire was captured using the predetermined codes on the questionnaire.
- Data cleaning: Data was checked to identify possible errors including inconsistencies, missing values, values out of a plausible range or disagreement within the answers to related questions.
- Graphical display of data: All collected data was initially graphically displayed to summarise variables. Frequency tables and histograms were used and simplified the identification of outliers and investigation of characteristics of the data, e.g. the central location and distribution.

Descriptive statistics were used to summarise and describe data. Variables were summarised by using frequency tables indicating the number and percentage of

participants in each category and histograms indicating the percentage of all participants falling into the categories.

For numerical variables, medians or means were used as the measures of central location and standard deviations or interquartile ranges as indicators of spread. Ordinal and quantitative variables were compared using the non-parametric Mann-Whitney U test. The relationship between nominal variables was compared using contingency tables and the Chi-square test, i.e. for comparing the frequency of different responses. A p-value of < 0.05 represented a statistical significant difference between the areas.

2.7.2 Analysis of qualitative data

A template (theory-based) analysis style combined with a crystallisation analysis style was used for this study. Collected data were organised into existing categories or themes, to provide new descriptions of previously known phenomena. In addition, the investigator examined the transcribed data and video recordings, crystallising out the most important aspects (Addendum 9).[83]

A systematic process of content analysis was used to manually analyse the qualitative data:[70,84]

1. Transcription of data: Voice recordings were meticulously transcribed verbatim after each FGD. In addition, video recordings were reviewed to ensure accurate transcription and include supplementary nonverbal cues.
2. Exploration of data: From early on in the data collection process, data were explored and continuously searched to identify common themes. The transcripts were thoroughly read a number of times in order to get a sense of each interview as a whole and find key phrases.
3. Coding of data: Eventually, units, based on the preconceived framework, were established as categories into which new ideas and information was collected. These units evolved and became more complex as data collection progressed.
4. Summarising of data: Finally, the isolated units were integrated into a meaningful framework. The captured data were explored to identify possible irrelevant data/discussions and key issues and to determine if collected data met the objectives of the study. These insights led the researcher to the final interpretation of the data.

2.8 ETHICAL AND LEGAL CONSIDERATIONS

2.8.1 Ethics review committee

A protocol of the study was composed during 2011 and 2012, prior to submission to the Health Research Ethics Committee, Faculty of Medicine and Health Sciences, Stellenbosch University. It was approved in October 2012 (Addendum 10).
The committee assigned the reference number S12/02/057 to the research project. Due to a slight change regarding the unavailability of health care workers, as discussed in Section 2.5.2, the protocol was adapted and resubmitted. An amended approval letter was received from the Health Research Ethics Committee in July 2013 (Addendum 11), after the pilot study, but prior to the commencement of data collection.

During this time, the 2007 version of the South African PFBDGs were under review. Due to time constraints, pressure to complete the research study as well as limited funding, it was decided to continue with the testing of the 2007 PFBDGs. It was felt that the results could still inform the current process, given that the study population was a very low income, peri-urban group with socio-cultural, and language profile that had not been previously tested.

A protocol of the study was also submitted to the Tshwane Research Committee, Department of Health and Social Development, to seek permission to perform the study in their PHC clinics in Soshanguve and Ga-Rankuwa. Permission was granted in January 2013 (Addendum 2).

2.8.2 Informed consent

Participation was voluntary and consent was obtained from each participant prior to involvement in the study. Participants were invited to take part at their free will and no incentives were offered. A number of suitable candidates declined to take part without stating a reason and their decision was respected without negative consequences. Once individuals were selected, they were introduced to the study and information was provided regarding the research project, including the aims, objectives, plans around data collection and the procedure of the FGD. The informed consent form was read out aloud in Northern Sotho by a voluntary participant (Addendum 1). Individuals were allowed to decide

whether they still wanted to continue with participation or to leave the discussion at any time. All individuals who agreed to participate completed and signed the informed consent form before data collection commenced. One participant volunteered to take part, but later had to leave the discussion due to other commitments.

2.8.3 Participant confidentiality

The investigator used the collected data only to meet the aim and objectives of this research project. Information and data were treated confidentially. Completed questionnaires were numbered and checked by the investigator, to ensure none went astray. They were transported and stored in a secured briefcase. On completion of the study report and thesis, the questionnaires, audio and video-recording as well as transcriptions, will be destroyed.

2.8.4 Equal opportunity

All clinic-attending mothers/caregivers who met the inclusion criteria were given an equal opportunity to participate in the study. All participants were treated professionally and in the same manner. Illiterate and semi-illiterate participants were assisted in completing the questionnaire. During the focus group discussion, all participants were requested to treat each other with respect and were given an equal opportunity to give their opinions.

2.8.5 Perceived risks and benefits

There were no perceived risks associated with taking part in this study.

The proposed benefits were that the study would provide an insight into the comprehension and applicability of the preliminary 2003 version of the PFBDGs and contribute to the development and testing of a final set of PFBDG applicable to the diverse population groups in South Africa. The results of the study will be passed on the Paediatric Working Group.

2.9 PILOT STUDY

A pilot study was conducted prior to the actual fieldwork. A small PHC clinic in the geographical area of Soshanguve, but not included in the study sample, was purposively selected for the pilot study. A group of five participants with similar characteristics to the target group was selected. The socio-demographic questionnaire (Addendum 4) was tested to confirm that the questions were clear, unambiguous and appropriate for the study population. The pilot FGD was subsequently conducted by using the probing questions and data capture sheet (Addendum 5) to ensure questions were clear and appropriate and could be discussed within a period of 60–90 minutes. The pilot study also allowed for the practice of methods to be used, including facilitation, observation and transcription.

No alterations were made to the socio-demographic questionnaire or data-capture sheet. However, some simplification was needed to improve the understanding of the term 'cultural and social acceptability' that was used as part of the probing questions in the data capture sheet. In order to simplify the concept, participants were asked to discuss the 'suitability' of each guideline whilst 'considering the way they live, including their cultural background, their living conditions and their income'.

Furthermore, practical issues were identified, such as the availability of a private room. This encouraged the investigator to visit clinics and confirm dates in advance, to ensure the availability of a room on the day of the discussion. The investigator further noticed that if the discussion lasted longer than 60 minutes it could cause participants to lose interest towards the end of the discussion and the infants started to get restless. It was therefore decided to limit the discussions to less than 60 minutes.

2.10 SUMMARY OF METHODS

The study was performed in six purposively selected PHC clinics in Soshanguve and Ga-Rankuwa. Written consent was provided by each participant prior to participation. A self-administered questionnaire was used to collect quantitative data about the participants' socio-demographic background. The investigator assisted illiterate participants in completing the questionnaire. The questionnaire was developed by using a standardised household questionnaire from the Statistics South Africa, Community Survey 2007.[80] Qualitative methods were then used to gather insight into the perceptions and attitudes of

participants towards the preliminary 2007 version of the PFBDGs. A predetermined framework was used to guide each discussion with the aim of assessing participants' exposure to, and comprehension and practical application of the guidelines. The investigator made notes during the FGDs and a voice- and video-recorder were used to record each discussion, and for data transcription and content analysis. All information was collected anonymously and treated confidentially.

CHAPTER 3

RESULTS

3.1 INTRODUCTION

The aim of the study was to assess the awareness, comprehension and applicability of the preliminary 2007 version of the South African PFBDGs for 6–12-month-old infants among mothers and caregivers of Northern Sotho infants in Soshanguve and Ga-Rankuwa. An observational, cross-sectional design was followed using quantitative and qualitative methods for data collection. Quantitative data were collected by means of a questionnaire to obtain information about the participants' socio-demographic background. Focus group discussions were used to collect qualitative data pertaining to participants' understanding, interpretation and applicability of the preliminary PFBDGs.

Results from 26 completed socio-demographic questionnaires and six FGDs will be systematically presented in this chapter. Quantitative and qualitative results are incorporated and presented to reflect the specific research objectives.

3.2 QUANTITATIVE RESULTS

3.2.1 Sample characteristics

The study sample comprised 27 subjects who participated in six FGDs. Twenty-six of the participants completed the socio-demographic questionnaire. One participant did not complete the questionnaire, but agreed to participate in the FGD. Three FGDs were conducted in Soshanguve and three in Ga-Rankuwa. Each FGD was attended by between three and six participants. Fifteen subjects participated in the three FGDs in Soshanguve and twelve subjects participated in the three FGDs in Ga-Rankuwa. The distribution of the number of participants was therefore fairly equal between the two geographical areas. In each area, a FGD was conducted in one large CHC and two smaller community clinics. Participant representation at community clinics is shown in Table 3.1.

Table 3.1: Participant representation at community clinics

		Geographical area	Participants	Questionnaires completed
Clinic A	Soshanguve CHC	Soshanguve	6	5
Clinic B	Soshanguve Clinic 2	Soshanguve	5	5
Clinic C	Soshanguve Clinic 1; Maria Rantho	Soshanguve	4	4
	Soshanguve TOTAL		**15**	**14**
Clinic D	Ga-Rankuwa CHC	Ga-Rankuwa	5	5
Clinic E	Ga-Rankuwa Phedisong 6	Ga-Rankuwa	4	4
Clinic F	Ga-Rankuwa View	Ga-Rankuwa	3	3
	Ga-Rankuwa TOTAL		**12**	**12**
	GRAND TOTAL		**27**	**26**

Ordinal and numerical variables of the two geographical areas were compared using the Mann-Whitney U test. The test indicated no significant difference in mean values between the areas with regard to personal background, including age and number of children, and level of education and household income of the mother/caregiver. Housing conditions relating to the average number of people who live in a dwelling was not significantly different. However, the average number of rooms per dwelling was significantly different, with a p-value of < 0.05. Table 3.2 presents the mean values and p-values of these variables.

Table 3.2: Comparison of ordinal and numerical variables of two geographical areas with the Mann-Whitney U test: mean values and p-values

VARIABLE	Mean (Soshanguve)	Mean (Ga-Rankuwa)	Mean (all areas)	p-value
Age	28.8	26.4	27.7	0.19
Number of children	1.8	1.8	1.8	0.93
Education level (level 4 = grade 10; level 5 = grade 12)	4.6	4.9	4.7	0.86
Household income (level 1 = less than R1000/month; Level 2 = R1001-R3000/month)	1.6	1.4	1.5	0.73
Number of rooms per dwelling	5.9	3.0	4.5	0.01
Number of people per dwelling	4.8	4.7	4.7	0.70

3.2.2 Socio-demographic profile of participants

3.2.2.1 Personal background

All the participants were females aged 19–50 years. At the time of the data collection, the majority of the participants were around 26 years old (median = 26), with the mean age 27,7 (± 7,8) years. With the exception of one respondent (who reported to be the baby's grandmother), all the other participants were the mothers of the infants. Almost half of the participants (47,8%) had given birth to only the one child. The others (52,2%) had between two and four children (Table 3.3). Eighty-eight percent were not married, 4% were legally married and 8% married traditionally.

Table 3.3: Participant profile: age and number of children born alive

	Mean	Median	Minimum	Maximum	Lower quartile	Upper quartile	Standard deviation
Soshanguve							
Age in years	28.8	27.0	19.0	45.0	24.0	33.0	7.0
Number of children	1.8	1.5	1	4	1	2.5	1.0
Ga-Rankuwa							
Age in years	26.4	23.0	19.0	50.0	21.0	28.0	8.8
Number of children	1.8	2	1	3	1	3	0.9
All areas							
Age in years	27.7	26.0	19.0	50.0	22.0	31.5	7.8
Number of children	1.8	2	1	4	1	3	0.9

3.2.2.2 Level of education

Figure 3.1 shows the education level attained by participants. All the participants had attained some level of education and 38.5% had completed matric/grade 12. A post-matric qualification, including a technikon degree, was attained by almost 30% of the participants, but nobody had attained a university degree.

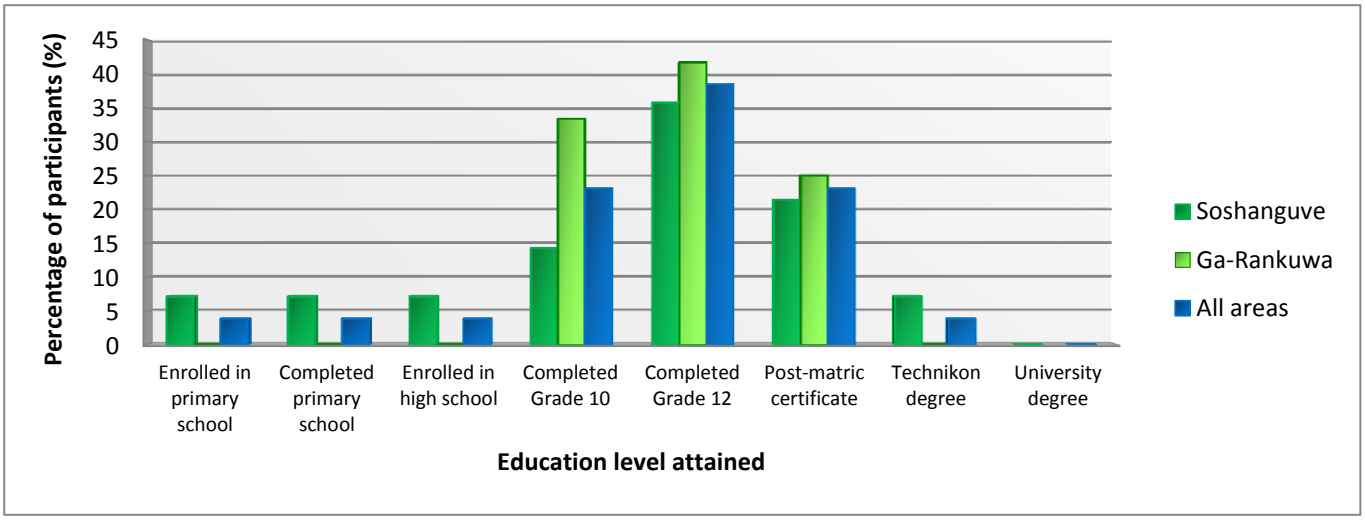


Figure 3.1: Education level attained by participants

3.2.2.3 Employment status and household income

Figure 3.2 shows the monthly household income of participants. Approximately one fifth of participants reported that they had no household income and, of those who did earn an income, only 44,0% reported their income to be sufficient to provide enough food for their household. The average household income is less than R3 000 per month, with the majority of participants earning less than R1 000 per month. The highest household

income that was reported by only one participant (4,2%) was between R10 001 and R20 000 per month. Nobody earned more than R20 001. Most of the participants (23,1%) earned their income via 'piece work', i.e. part time, temporary employment of any kind.

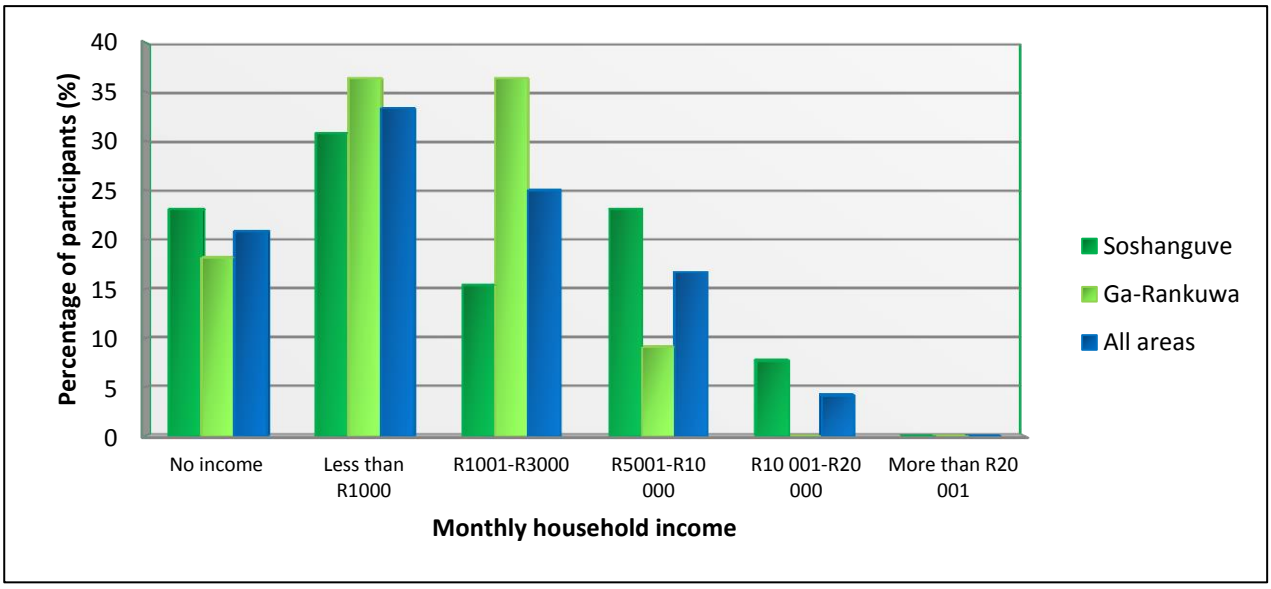


Figure 3.2: Monthly household income of participants

3.2.2.4 Housing conditions

Most of the participants indicated that they were living in a structured building, i.e. a house or brick structure, a room or a flat. Approximately one quarter of participants lived in an informal, traditional structure such as a hut or a shack (Figure 3.3).

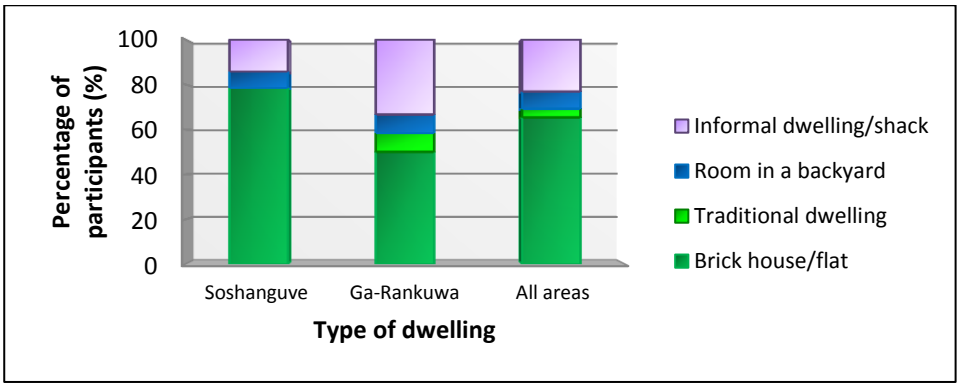
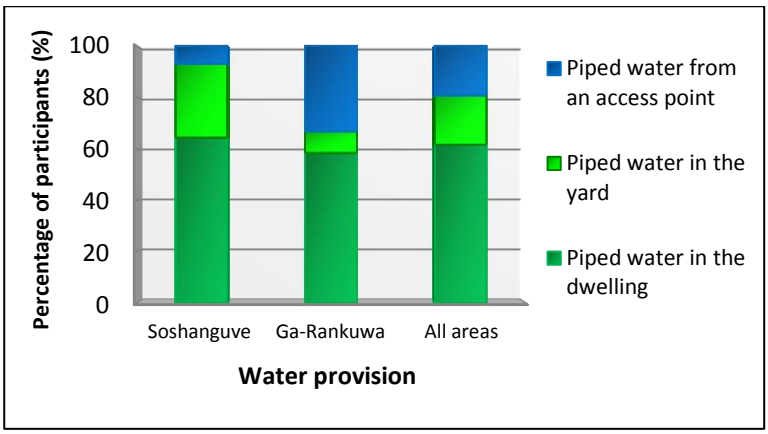


Figure 3.3 Housing conditions: type of dwelling

The majority of the houses (23,1%) had four rooms (median=4), accommodating four to five people (median=4,5). All of the participants reported having access to piped water, with the majority inside their dwelling. Flushed toilets were available to most (n=85%) of the participants and some used pit toilets (Figure 3.4).



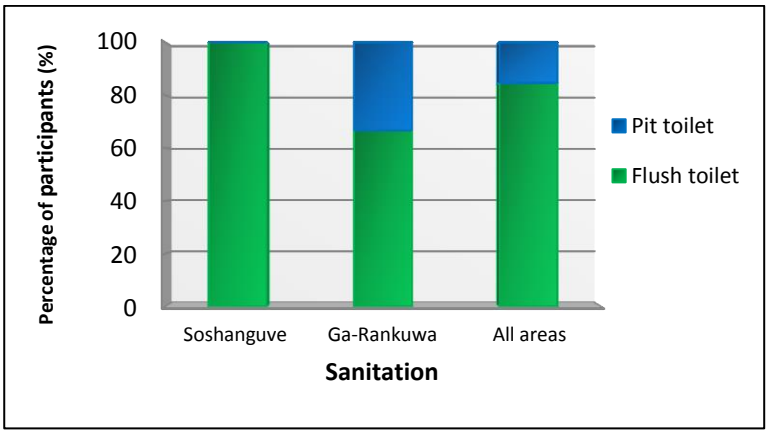


Figure 3.4 Housing conditions: water and sanitation

Most of the participants used electricity for cooking (n= 88%); two used gas and one used paraffin. Only two participants indicated that they used candles for lighting, the others used electricity (Figure 3.5).

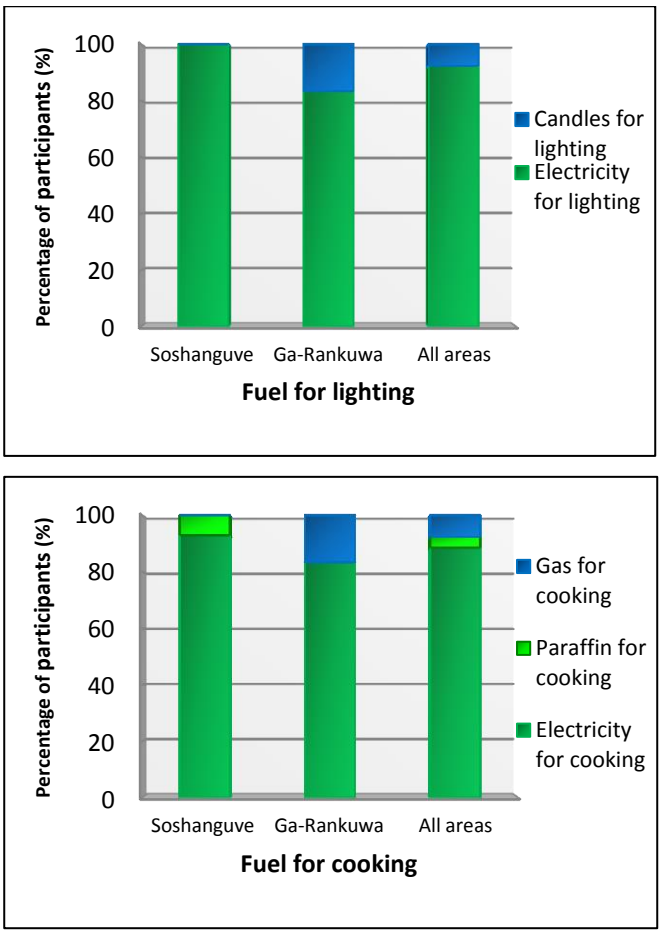


Figure 3.5 Housing conditions: energy provision

3.2.2.5 Household goods

The majority of households had refrigerators, radios, television sets (TV) and postal facilities. Only about a quarter of households reported having computers and only two participants indicated having internet access at home. All the participants had cell phones, but only a quarter had landline telephones (Figure 3.6).

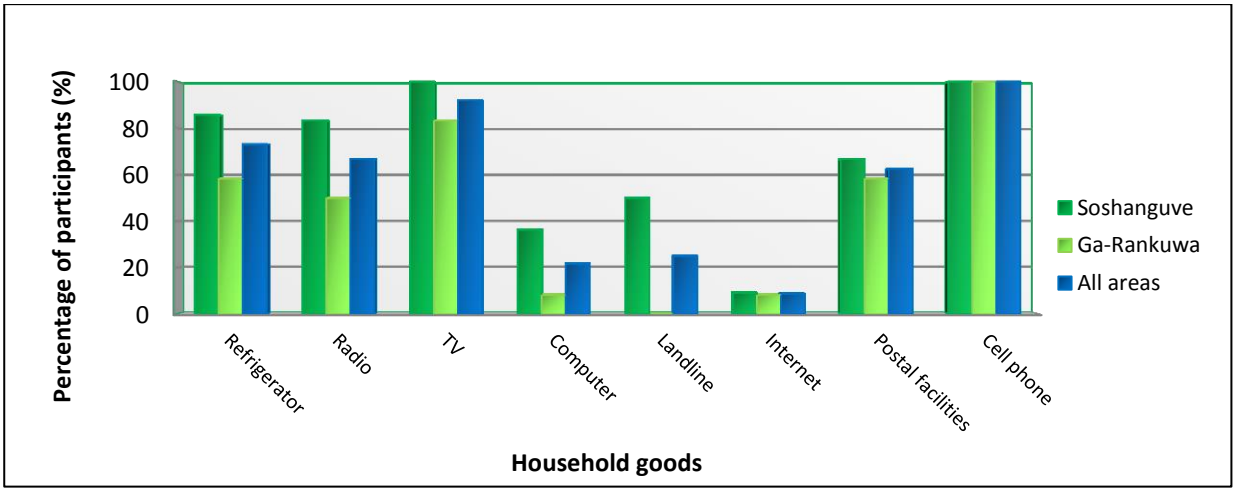


Figure 3.6 Possession of household goods

3.2.3 Study representation of regional statistics

The results of this study (hereafter, simply referred to as 'study results') were compared to the results of the Statistics South Africa, Community Survey 2007, Household Questionnaire for the Gauteng area (hereafter, simply referred to as 'Community Survey').[80] The overall chi-square test was used and indicated no statistical significant difference between these results (p=0.9965). The sample therefore reflects the population statistics regarding education, employment and housing conditions. Tables 3.4–3.6 present the percentage of the population/participants in each category.

Table 3.4: Comparison of Community Survey results and study results, with p-values: education and employment

CATEGORY	VARIABLES	Community Survey results (% of population)	Study results (% of participants)	p-values
EDUCATION	No schooling	4.20	0.00	0.29
	Higher education	23.40	27.00	0.67
	Matric	34.00	38.00	0.63
EMPLOYMENT	Unemployed	24.20	21.00	0.70

Table 3.5: Comparison of Community Survey results and study results, with p-values: type of housing and housing conditions

CATEGORY	VARIABLES	Community Survey results (% of population)	Study results (% of participants)	p-values
TYPE OF HOUSING	Formal	70.80	77.00	0.49
	Informal	26.80	23.00	0.67
HOUSING CONDITIONS	Water inside	62.50	62.00	0.92
	Water outside	18.20	19.00	0.89
	Water from access point	16.40	26.00	0.70
	Flush toilet	76.60	85.00	0.33
	Pit toilet	21.50	15.00	0.45
	Bucket toilet	0.80%	0.00	0.65
	Electricity for cooking	74.10	89.00	0.09
	Electricity for lighting	77.40	92.00	0.07

Table 3.6: Comparison of Community Survey results and study results, with p-values: household goods

CATEGORY	VARIABLES	Community Survey results (% of population)	Study results (% of participants)	p-values
HOUSEHOLD GOODS	Cellphone	83.30	100.00	0.03
	Radio	79.90	67.00	0.12
	Computer	24.20	22.00	0.78
	Internet	12.80	9.00	0.56
	Refrigerator	70.80	73.00	0.80
	TV	74.10	92.00	0.04
	Telephone landline	24.80	25.00	0.98

3.3 QUALITATIVE RESULTS

During the course of the study, a total of six FGDs were conducted in Soshanguve and Ga-Rankuwa. Qualitative data were collected to gain insight into the participants' perceptions and attitudes towards each preliminary PFBDG. Each discussion followed the same procedure; it was facilitated by the investigator and directed by using pre-determined probing questions (Addendum 5). The investigator took detailed notes of each discussion along with voice and video recordings. The aim with each FGD was to gather information about the participants' exposure, interpretation, cultural acceptability and practical application of each preliminary PFBDG for 6–12-month-old infants. Following the FGDs, data were transcribed and analysed manually (Addendum 9) to identify and categorise common themes.

This section present a summary of the qualitative results obtained from content analysis whilst reflecting the specific research objectives for each preliminary PFBDG.

3.3.1 Exposure to the preliminary PFBDGs

3.3.1.1 Participants' exposure in the PHC clinics in Soshanguve

Participants in Soshanguve, indicated that, although they had not heard about the term 'FBDGs' before, they were nonetheless familiar with the concepts. Exposure to the concepts was via their clinic or hospital, from staff and information posters. Another familiar source of information often included family members and sometimes also friends, neighbours, 'people on the street' and the media via television, newspapers, books and the internet.

Participants were familiar with Guideline 2, Guideline 4 and Guideline 7, pertaining to the introduction of solid foods, breastfeeding and clinic visits, respectively. Participants were also familiar with Guideline 5 and Guideline 6 (safe water provision and cup-feeding, respectively). However, for Guideline 1 ("Enjoy time with your baby"), the exposure was not evident, although particpants regarded it as being obvious and part of their daily behaviour. Participants in Soshanguve were unfamiliar with Guideline 3 ("Gradually increase your baby's meals to five times a day"). See Table 3.7.

Table 3.7: The Preliminary 2007 version of the SA PFBDGs

GUIDELINE	
Guideline 1	"Enjoy time with your baby"
Guideline 2	"From 6 months start giving your baby small amounts of solid foods"
Guideline 3	"Gradually increase your baby's meals to five times per day"
Guideline 4	"Keep on breastfeeding your baby"
Guideline 5	"Offer your baby clean, safe water regularly"
Guideline 6	"Teach your baby to drink from a cup"
Guideline 7	"Take your baby to the clinic every month"

3.3.1.2 Participants' exposure in the PHC clinics in Ga-Rankuwa

In Ga-Rankuwa, participants were also unfamiliar with the term 'FBDGs'. Exposure to the guidelines was limited and even the concepts were sometimes perceived as unfamiliar. The source of exposure to the known concepts was similar to Soshanguve's, i.e. always via their clinic or hospital. Here too, other sources of information often included family members, friends, neighbours, "people on the street", "people in taxis", and the media, including radio, television and magazines.

Participants confirmed that they were familiar with Guideline 4 pertaining to breastfeeding practices. They were also exposed to the concepts of Guideline 2 and Guideline 5 related to the introduction of solid foods and the offering of safe water, respectively. Guideline 7 ("Take your baby to the clinic every month") was unfamiliar to participants in Ga-Rankuwa, but they thought that it "made sense". The term "Enjoy time with your baby" (Guideline 1) was unfamiliar, but they also regarded this as an obvious statement. Guideline 3 and Guideline 6 – regarding increasing the baby's meals to five times per day and cup-feeding – was an unfamiliar concept. See Table 3.7.

3.3.2 Participants' understanding and interpretation of the preliminary PFBDGs

3.3.2.1 Guideline 1: "Enjoy time with your baby"

Participants interpreted the meaning of this guideline as:

"Caring", i.e. taking care of their infants and meeting their needs, including daily responsibilities such as feeding, cleaning and looking after them. (FGD nr 2, 4, 5 to A Pretorius 2013)

"Bonding" with their child, i.e. loving them, holding them, communicating with them, playing with them and having fun together. (FGD nr 3, 4 to A Pretorius 2013)

Spending "time" together. (FGD nr 1, 3, 4, 5 to A Pretorius 2013)

The view was that mothers should try to spend as much time as possible with their infants with responses such as "all the time" and "all day". However, the working mothers who participated felt they could not always meet this requirement. Some of the working mothers even appeared to be stressed about this demand and torn between spending time with their baby and having to provide for their families financially.

In Soshanguve, respondents seemed to understand the concept, but focused much more on the "time" aspect. The following phrases were raised when asked to interpret the concept of "enjoying time with your baby":

"Spend time with your baby means to enjoy them" (FGD nr 1 to A Pretorius, 2013)

"Spend time at home" (FGD nr 3 to A Pretorius 2013)

"Take time with your baby" (FGD nr 3 to A Pretorius 2013)

"Stay with your baby to get to know him better" (FGD nr 3 to A Pretorius)

"Spend as much time as you can with your baby" (FGD nr 2 to A Pretorius)

It was accepted that spending time together allows the parent to get to know the baby and appreciate and adore its development.

Additional probing was needed from the investigator to collect insights around other aspects, especially as related to feeding, which may be associated with this concept of "enjoyment". Respondents then mentioned that breastfeeding might be an opportunity to bond with their infant and enjoy time with them.

In Ga-Rankuwa, the concept was associated with fulfilling the baby's needs, e.g. "caring", "bonding" and "feeding". Even after probing, the investigator was unable to gather more extensive responses.

Participants thought that the guideline was well understood and “perfect”, with no need to change it. A few suggested some changes to the wording to make it more expressive, e.g.

> “Love your baby more than anything” (FGD nr 4 to A Pretorius 2013)
>
> “Baby must be your first priority” (FGD nr 6 to A Pretorius 2013)
>
> “Spend time with your baby” (FGD nr 5 to A Pretorius 2013)

3.3.2.2 Guideline 2: “From 6 months start giving your baby small amounts of solid foods”

To collect information about the participants’ interpretation of this guideline, predetermined probing questions (Addendum 5) focused on gathering perceptions around “small quantities” and “textures” suitable for a 6-month-old baby. Models of food textures and quantities (refer to Figure 2.6) were used to avoid prevent ambiguous responses.

Participants agreed that a teaspoon represented a small amount of solid food suitable for a 6-month-old baby, but the number of teaspoons per day varied greatly, between 1 and 6 teaspoons, between one and six times per day. Some participants regarded a tablespoon as a suitable measure for a 6-month-old. In Soshanguve, one participant suggested a tablespoon of solid food once per day, but another respondent disagreed and thought that it was too much. The majority of participants agreed that a smooth texture was suitable for a 6-month-old baby, but a few suggested a lumpier, solid texture.

In Soshanguve, one respondent reported that the baby was used to drinking milk and needed a smooth transition from liquids to solid food. She therefore regarded smooth, thin, runny textures as being appropriate. Another respondent thought that a lumpier, solid texture was more suitable at the age of 6 months, to ensure that “they eat well”. In Ga-Rankuwa all agreed that a smooth texture was appropriate as a first solid food and one respondent specifically suggested maize “porridge”.

Respondents reported that they understood this guideline and no major changes were needed to improve the comprehension thereof. However, a few suggested rephrasing or elaborating on “small amounts” to include measurable quantities, e.g. the number of spoons or cups. Although the phrase was generally well understood, there appeared to be confusion around the suitable quantities and textures for infants who were introduced to solid foods. Many participants were outspoken, but a lot also withdrew during the discussion as a way of expressing their confusion.

3.3.2.3 Guideline 3: "Gradually increase your baby's meals to five times per day"

"Gradually" was mainly interpreted as "increasing food intake as the baby grows/gets older" or "step-by-step", but some respondents did not understand the concept. In Soshanguve, the respondents in two of the clinics thought that the meaning of "gradually" was unclear, but one respondent suitably described it as "starting with three meals and increase on demand", with the emphasis on demand feeding.

Respondents misinterpreted the concept of a "meal" and did not differentiate between a meal and a snack. After probing, the following was gathered:

A snack was regarded as

> "Smaller than a meal" (FGD nr 5 to A Pretorius 2013)
>
> "Lighter than a meal" (FGD nr 6 to A Pretorius 2013)
>
> "It did not stay long in the stomach" (FGD nr 2 to A Pretorius 2013)
>
> "Given between meals" (FGD nr 1 to A Pretorius 2013)
>
> "Sometimes given to entertain a baby" (FGD nr 2 to A Pretorius 2013)

Fruit, biscuits and drinks were regarded as snacks. Meals were more "heavy" and included cooked maize (with or without a packet of soup mix), rice, samp (dried, stamped corn kernels), bread or mashed vegetables. Only one participant perceived five meals as anything the baby ate, including meals and snacks.

Some participants thought that no changes were needed to this guideline. However, after probing by the investigator, they suggested some changes to the wording in order to improve the understanding. The following suggestions were made:

> Consider the use of a phrase such as "feed on demand" – as not all infants may want to eat five meals per day (FGD nr 3 to A Pretorius 2013)
>
> Differentiate between "snacks", "meals" and "drinks" (FGD nr 1 to A Pretorius 2013)
>
> Be more specific by including the number of snacks, meals and drinks needed (FGD nr 6 to A Pretorius 2013)
>
> State the age at which these are needed (FGD nr 2, 5 to A Pretorius 2013)
>
> Specify what kind of foods are needed (FGD nr 2, 5 to A Pretorius 2013)

Confusion existed around the terminology used in this guideline, causing participants to misinterpret the guideline. Misinterpretation also caused inconsistency in the reporting of food intake. Some participants reported they fed their infants a meal only three times per

day, in the morning, afternoon and evening; however, the investigator observed that they were actually giving them snacks during the FGD that was performed mid-morning, although these might have been given to keep the child entertained and might not refer to usual practice.

3.3.2.4 Guideline 4: "Keep on breastfeeding your baby"

Guideline 4 was well understood and no misconceptions existed around what kind of milk was best for infants aged 6–12 months. Participants agreed that breast milk was best. A breast milk replacement formula was regarded as an option, should the mother be unable to continue breastfeeding due to physical inability or unfavourable circumstances.

In Ga-Rankuwa, one respondent reported that "circumstances may prevent a working mother from breastfeeding" and this may be considered a reason for introducing a breast milk replacement formula.

However, confusion existed around up to what age breastfeeding should continue; nobody was aware of any existing guidelines about this. Various responses were recorded: 6 months, 1 year, 18 months, 2 years, 3 years, and even 6 years. Although many respondents suggested that breastfeeding should continue up to the age of 2 years, they acknowledged that it was the mother's personal choice.

In conclusion, mothers accepted this guideline and it was well received, as supported by breastfeeding practices during FGDs. Mothers appeared passionate about breastfeeding their infants, thereby providing them with optimum and affordable nutrition. Suggested changes, however, include guidance regarding up to which age breastfeeding is advantageous. One respondent in Soshanguve also felt that mother should "always" breastfeed, i.e. continue during all circumstances.

3.3.2.5 Guideline 5: "Offer your baby clean, safe water regularly"

"Clean" water was mainly perceived as

- "boiled water" (FGD nr 1, 2, 5, 6 to A Pretorius 2013)
- water in a "clean, closed container" (FGD nr 3 to A Pretorius 2013)
- "tap water" or "running water", but not necessarily boiled. (FGD nr 4 to A Pretorius 2013)

"Safe" water was considered to be

"boiled water" (FGD nr 1, 6 to A Pretorius 2013)
water in a "closed or covered container" (FGD nr 2, 5 to A Pretorius 2013)
"tap water" or "running water", also not necessarily boiled (FGD nr 2, 4 to A Pretorius 2013)
"bottled water", not boiled. (FGD nr 3 to A Pretorius 2013)

In Soshanguve, most participants agreed that water should be boiled and cooled before being offered to a baby. A few considered tap water as being safe and clean, and it was unnecessary to boil it. The terms "safe" and "clean" were considered to have the same meaning and participants were unable to differentiate between the terms. When asked how they interpreted "safe" water, participants used the phrase "like we're saying" to indicate that they already covered the question when "clean" water was discussed.

In Ga-Rankuwa, respondents were less concerned about boiling their water. Only one respondent considered it necessary to boil water to give to a baby. In the other two clinics, even after probing by the investigator, many did not think about mentioning the need to boil any water for a baby. One respondent did however mention that water may need to be purified with a household bleach solution (1 teaspoon household bleach + 5 litres water), but they never needed to do this as their water was considered to be "always clean".

The term "regularly" caused confusion amongst participants and received mixed interpretations, including the following:

"as much as possible" (FGD nr 1 to A Pretorius 2013)
"always" (FGD nr 4, 6 to A Pretorius 2013)
"often" (FGD nr 2 to A Pretorius 2013)
"now-and-then" (FGD nr 2 to A Pretorius 2013)
"occasionally" (FGD nr 3 to A Pretorius 2013)
"after every meal" (FGD nr 3, 5, 6 to A Pretorius 2013)
"as an alternative to milk or in between milk feeds" (FGD nr 1 to A Pretorius 2013).

In Soshanguve, participants were more concerned about how much water should be given instead of using a general term such as "regularly". They wanted to know if a glass of water, two glasses or two bottles per day were required. They then agreed that the quantities may vary for each baby, but, most importantly, all infants should receive water. If

infants were reluctant to take water, they decided that spoon-feeding of small volumes or sweetened water would encourage intake.

Participants felt that no changes were needed for this guideline, but the investigator probed for more responses, as there appeared to be inconsistent opinions on what was considered to be “safe” and “clean” water. It was then recommended by one clinic in Soshanguve that the statement should include the word “boiled” water. It was also proposed to add advice as to how much and from what age water should be introduced. One respondent in Ga-Rankuwa suggested, also after probing, that education was needed to ensure that everybody was aware of what was considered as safe and clean water.

3.3.2.6 Guideline 6: “Teach your baby to drink from a cup”

Models were used during the discussion of Guideline 6 to illustrate possible feeding cups (refer to Figure 2.7). Prior to presenting the models, participants were first asked what they perceived as a suitable feeding cup for a baby so as to not affect their own perception. Most of the participants understood the concept of cup-feeding. The majority considered a cup with two handles, with or without a spout, to be suitable for a baby as they could easily hold this. Probing was needed to gather more information about the possibility of using alternative cups, after which a few agreed that an ordinary cup (open top, and with or without handles) could also be used when assistance was provided. Even though a feeding bottle was also presented, nobody perceived a bottle as a cup.

Common phrases that were used to describe a suitable cup included the following:

> “Sippy cup”, i.e. a closed cup with a spout and handles. The majority agreed with this, as “small children can hold the handles and won’t spill”. (FGD nr 1, 4 to A Pretorius 2013)
>
> “Open cup with two handles”, i.e. no lid or spout, but two handles. (FGD nr 1, 2, 3, 5 to A Pretorius 2013)
>
> “Normal cup”, i.e. an ordinary cup, “but the baby would need assistance”. One participant in Ga-Rankuwa reported using an ordinary cup when offering water to her baby. A few of the other participants in this particular FGD then agreed that an ordinary cup was suitable, “but the mother would need to hold the cup for the baby”. (FGD nr 5, 6 to A Pretorius 2013)

Although participants agreed that ordinary or “open” cups were suitable for feeding infants, they appeared very sceptical, and it was doubtful whether they would really consider using these types of cups.

Participants initially did not think that any changes to this guideline were necessary. However, after probing by the investigator it was suggested that this guideline should include information regarding which age was appropriate to introduce cup-feeding, what kind of cup was suitable and how to teach a baby to drink from a cup. One participant suggested adding a description of a suitable cup.

3.3.2.7 Guideline 7: “Take your baby to the clinic every month”

To assess the interpretation of this guideline, participants were initially asked to describe a suitable clinic where they could take there infants. The most important aspect, raised by almost all the participants, was that a suitable clinic would be “local” and “easily accessible”. Other aspects that were also considered as being essential for a clinic to be suitable included the following:

Staff availability, e.g. “available sister to check the baby” and “nurses to assist patients” (FGD nr 1 to A Pretorius 2013)

Knowledgeable staff (FGD nr 1 to A Pretorius 2013)

Friendly staff who “treats the baby well” (FGD nr 3 to A Pretorius 2013)

“Customer service” orientated (FGD nr 2 to A Pretorius 2013)

Shorter waiting times and queues (FGD nr 4 to A Pretorius 2013)

Informative, with posters (FGD nr 1 to A Pretorius 2013)

Clean and safe environment (FGD nr 3, 5 to A Pretorius 2013)

Participants agreed that it was essential to take a baby to the clinic regularly. They reported that these clinic visits were necessary, and required to

Monitor a baby’s weight, height and growth (FGD nr 2, 4, 5, 6 to A Pretorius 2013)

Receive immunisations to prevent illnesses and infections (FGD nr 2, 3 to A Pretorius 2013)

Treat illnesses, i.e. “when the baby is ill” (FGD nr 1 to A Pretorius 2013)

Receive advice from nurses regarding how to care for their babies, including feeding advice (FGD nr 6 to A Pretorius 2013)

Participants accepted that a small baby should be taken to the clinic every month or when the baby was ill. A few participants thought that older infants, from the age of 6 months, did not need monthly visits and that three-monthly visits would be sufficient.

Guideline 7 was well received and well understood. The majority of participants did not feel that any changes to this guideline were needed, but a few wanted the guideline to indicate up to what age monthly clinic visits were required. One clinic also thought that the guideline should state why a young baby needed to be taken to a clinic every month.

3.3.3 Acceptability of the preliminary PFBDGs

To assess the acceptability of the preliminary PFBDGs amongst the target group, the investigator aimed at gathering insight into the participants' attitudes towards the guidelines when their cultural and socio-economic background are taken into consideration. Participants initially failed to recognise the concept of cultural and socio-economic "acceptability" and clarification was needed during each discussion to ensure that they correctly interpreted the terminology. To simplify the concept, participants were asked to discuss the "suitability" of each guideline whilst "considering the way they live, including their culture, their living conditions and their income".

3.3.3.1 Cultural acceptance

With the exception of Guideline 2 ("From 6 months start giving your baby small amounts of solid foods") and to some extent Guideline 3 and Guideline 7 (pertaining to increasing meals to five times per day and monthly clinic visits, respectively), cultural background was not identified as a barrier to the acceptance of the guidelines. Generally, participants were supported by their society insofar as the overall care of their infants was concerned. However, the investigator sensed that, within this cultural group, mothers were expected to spend time with their infants and take on the role of their primary carer. Involvement from fathers and other family members appeared to be very limited.

In some clinics, the suitability of Guideline 1 ("Enjoy time with your baby") was initially misinterpreted and participants focused mainly on the financial constraints that made it difficult to fully accept and apply this guideline. After probing and direction from the investigator, participants then agreed that their society supported this concept and regarded it as being necessary for the baby's development.

Guideline 4 pertaining to breastfeeding was definitely the most well accepted guideline, not only because breastfeeding was considered the best form of nutrition to keep an infant healthy, but also because it did not involve any expenses. Most of the mothers were comfortable to breastfeed in public at the PHC clinics and during FGDs. Only one participant acknowledged and understood that some cultures may be reluctant to breastfeed in public and may "need privacy". Participants further reported that breastfeeding

> "Saves time, as no need to sterilise bottles" (FGD nr 1, 2 to A Pretorius 2013)
> "Saves money" (FGD nr 1, 2, 4 to A Pretorius 2013)
> "Prevents dehydration" (FGD nr 2 to A Pretorius 2013)
> Prevents infections, as dirty "bottles could cause illness" (FGD nr 3 to A Pretorius 2013)
> Acts as a "medicine to protect babies" (FGD nr 1 to A Pretorius 2013)
> Could even be continued by "working mothers who can express" (FGD nr 1, 2 to A Pretorius 2013)

Guidelines 5 and 6, pertaining to regular offering of clean, safe water and cup-feeding were both accepted without further considerations.

Guidelines 3 and 7, pertaining to offering five meals per day and monthly clinic visits were accepted to some extent.

The concept of five meals per day (Guideline 3) was unfamiliar. One participant in Ga-Rankuwa reported that she had never "seen anybody else feeding their baby five times per day". However, other participants mentioned that it depended on "the kind of meal", i.e. five feeding times that included meals and snacks would be acceptable.

Regarding monthly clinic visits (Guideline 7), one participant in Ga-Rankuwa reported that her elders did not think that monthly clinic visits were necessary. The others participants mainly agreed with the concept of Guideline 7, but a few reported that they would also consider taking an ill baby to a traditional healer.

Guideline 2 generated the most contentious discussion, specifically around the timeous introduction of solid foods. Although the guideline was generally well accepted, and most of the participants had often been exposed to the concept, cultural influences affected their

acceptance of this guideline. Mothers generally agreed that 6 months was regarded a suitable age at which to introduce solid foods, but they reported that the older generation believed that solid foods should be introduced at an earlier age, sometimes as soon as straight after birth. Force-feeding (closing the baby's nostrils, opening the mouth and driving food down the throat) may even be encouraged by some elders when a baby does not cooperate with eating and swallowing at an early age. Many elders believed that milk alone did not satisfy a baby and solid foods were needed to ensure appropriate development, such as walking. Responses included the following:

> "My culture suggests staring with solids at the age of 3 months" (FGD nr 4 to A Pretorius 2013)
>
> "Some elders even suggests starting at 3 weeks" (FGD nr 4, 6 to A Pretorius 2013)
>
> "Whenever a baby cries, elders may say the baby is hungry" (FGD nr 3 to A Pretorius 2013)
>
> "When a child gets hungry and breast milk is insufficient, solids may be given from a month" (FGD nr 5 to A Pretorius 2013)
>
> "Food and water may be given straight after birth" (FGD nr 2, 3 to A Pretorius 2013)
>
> "Herbal medicine are given to 'treat' the fontanel" (FGD nr 2 to A Pretorius 2013)
>
> "Water is given to prevent dehydration" (FGD nr 5 to A Pretorius 2013)

3.3.3.2 Socio-economic circumstances affecting acceptability

The lack of income, support and knowledge was often raised as a hindrance in accepting a guideline. Particularly for Guideline 1, participants reported that the lack of income and financial support prevented them from enjoying time with their infants. After guidance and probing by the investigator, they agreed that enjoying time with their infants may be culturally acceptable, but the majority still found it challenging due to stress caused mainly by financial constraints, as some stated:

> "It's not a good time now, I'm not working, I cannot afford a baby and I am HIV positive" (FGD nr 4 to A Pretorius 2013)
>
> "I have no support, no husband, no boyfriend, no mother" (FGD nr 4, 6 to A Pretorius 2013)
>
> "I have to work and cannot enjoy time with my baby" (FGD nr 5, 6 to A Pretorius 2013)

In contrast, one respondent reported that she had insufficient income and this prevented her from buying everything, that but she was still able to enjoy time with her baby. Others agreed that “spending time does not involve any expenditure”.

Guideline 3 (“Gradually increase your baby’s meals to five times per day”) was not always well received. Unaffordability was raised as the main constraint for accepting this guideline. Considering the participants’ socio-economic circumstances, five meal or snacks per day may be unreasonable and may jeopardise the nutritional content of the meals. One respondent reported that acceptability “depends on the kind of meal; pap[8] may be affordable, but not other food”. Another respondent reported that “many received the child support grant and couldn’t afford to feed their babies five times per day”.

3.3.4 Practical application of the preliminary PFBDGs

The majority of the guidelines were regularly applied by the participants. With the exception of Guideline 2, Guideline 3 and Guideline 6 (pertaining to the introduction of solid foods, offering five meals per day and cup-feeding, respectively) mothers accepted and reported that these guidelines were part of their everyday routine.

3.3.4.1 Frequently applied guidelines

The practical application of Guideline 1, Guideline 4 and Guideline 7 was confirmed by the investigator as participants were observed whilst spending time with their infants at the clinic, observed whilst breastfeeding during the discussion and in the waiting areas, and they were attending the clinics with their infants.

With regard to Guideline 1 (“Enjoy time with your baby”), a few participants reported that they enjoyed being with their infants. They reported to be happy when spending time together whilst playing, laughing, singing and caring for them. Although all the participants agreed that it was important, only a few respondents appeared to be sincerely happy to be with their infants. Some participants appeared distressed and reported that they could not enjoy their time together due to lack of support and income. The majority presented with a

[8] Pap *is a maize meal porridge typically cooked with water. It is a bulky food of low nutrient value and contains phytates that inhibit absorption of iron and zinc.*[35] *This, together with the low energy density of maize, may hamper the growth of infants and increase the risk of stunting during early childhood.*[35,51]

neutral expression and focused on chores such as feeding, breastfeeding and cleaning hands during the discussion.

Respondents reported to be breastfeeding their infants, concurrent with Guideline 4. Reasons given for not breastfeeding included that mothers returned to work and mothers who were HIV positive. Only one respondent discontinued breastfeeding because the baby would not accept the breast and one reported she was losing too much weight because of breastfeeding. Participants planned to continue breastfeeding their infants up to the age of anything between 6 months and 3 years. One reported to have breastfed up to the age of 6 years.

Participants reported that they were bringing their infants to their local clinic every month (Guideline 7) or more often if they were ill. A clinic date was booked one month in advance every time they visited their clinic. Only one respondent reported that there was no clinic nearby and unaffordable taxi fares prevented her from attending monthly. Participants also reported that apart from taking their infants to the clinic, they may also take them to a paediatrician, a doctor, the hospital or a pharmacy when needed; only a few may use a traditional healer when the baby is ill.

3.3.4.2 Partially applied guidelines

Participants were familiar with Guideline 5 (“Offer your baby clean, safe water regularly”) and agreed that it was important to offer their infants clean and safe water regularly, but not everybody appeared to be applying it. The concept of “clean” and “safe” water was not well understood and was perceived in different ways. Although many participants gave their infants boiled tap water, some did not consider it necessary to use boiled water; they used either tap or bottled water for their infants, without boiling it. One respondent in Ga-Rankuwa reported that a paraffin stove was needed to be heated before water could be boiled and even though she considered it important to boil the baby’s water, practical hindrances may not allow her to always do this.

With regard to the frequency of offering water, most of the participants were aware that infants needed water regularly. When asked how often they offered water to their infants, common responses included the following:

> “As often as possible” or “anytime” (FGD nr 1 to A Pretorius 2013)
>
> “Depends on the season” (FGD nr 2 to A Pretorius 2013)

"On demand, when thirsty" (FGD nr 2 to A Pretorius 2013)
"After a meal" (FGD nr 5, 6 to A Pretorius 2013)
"Twice per day" (FGD nr 4, 6 to A Pretorius 2013)

Participants appeared to be very aware of the risk of dehydration and therefore all of them offered their infants water frequently. Other fluids also commonly used included juice and rooibos tea a few times per week. One respondent in Ga-Rankuwa reported to be giving water with sugar added. Another respondent in Soshanguve recognised the risk of tooth decay associated with high intakes of juice and sugar-based drinks and therefore avoided these drinks.

3.3.4.3 Dubious application of guidelines

The practical applications of Guideline 2, Guideline 3 and 6 Guideline were questionable. With regard to Guideline 2 ("From 6 months start giving your baby small amounts of solid foods"), many participants were aware that complementary feeding ought to commence at 6 months because that is what they were advised by health care professionals. However only a few really understood why this was generally advocated. Some respondents reported that 6 months was an appropriate age, because then a baby's digestive system would be "functioning well enough to receive solids" or up to this age "the stomach is still preparing to receive food". Despite previous cultural beliefs of the earlier introduction of solid foods, the majority of participants reported to have commenced complementary feeding at 6 months, starting with a thin, smooth, soft maize porridge or commercial instant baby cereal. Some respondent started with complementary feeding before the age of 6 months. A few introduced solid foods (soft maize porridge or commercial instant baby cereal) aged 2–4 months. A few started to introduce soft cooked maize porridge between the ages of 2 and 6 weeks and one respondent introduced commercial instant baby maize cereal at 5 days. Even though the majority of participants have been exposed to Guideline 2, much uncertainty still exists around whether this is indeed the best time to introduce complementary feeding.

The following information was gathered regarding the type and quantity of solid foods given to the infants at different ages.

- At 6–7 months: Participants mainly offered commercial instant baby cereal mixed with formula milk or soft maize porridge made with water. Only a few used vegetables at this age. Quantities varied between 1 teaspoon and 1 bowl (200 ml), once to three times per day.

- At 8 months: Many still fed maize porridge. Others started to introduce “pap” (maize meal cooked with water to a firm consistency) with a packet of soup mix and vegetables. Quantities were generally a bowl (200 ml) of food, three times per day.
- At 9–10 months: A wider variety of foods were more common at this age, including commercial instant baby cereal, commercial bottled baby food (stages 2 and 3), cooked maize meal (“pap”) with margarine or a packet of soup mix, mashed vegetables including potatoes, pumpkin, spinach, tomato. Some participants offered their infants yoghurt, commercial baby juice, commercial teething biscuits and commercial bottled baby fruit purée. Only one participant reported giving meat at this age, but the others frowned upon this and thought it was inappropriate. Quantities varied between 5 teaspoons, 3–4 tablespoons and 1 bowl (200–250 ml) three to four times per day.
- At 12 months: Mainly soft maize porridge for breakfast, cooked maize with a packet of soup mix and vegetables including mashed potatoes, butternut or spinach for a main meal were common at this age. Only a few participants reported using meat or chicken. Fish was not regarded as being suitable. The use of vegetables and fruit was very limited; some did not use them at all. Only one respondent reported to be giving her baby the same food as the rest of the family. Quantities varied between 100 ml, 1 bowl (200 ml) and 1 cup (250 ml) per meal, mainly three times per day, although one respondent reported feeding five to six times per day.

The discussion of Guideline 3 (“Gradually increase your baby’s meals to five times a day”) indicated that participants were unable to apply this guideline to the full extent. When the investigator probed for responses regarding meal frequency, the following responses were received:

- Participants with infants aged 6 months mainly reported to be feeding their infants between once and three times per day.
- At 7 months, participants fed their infants mainly three to four times per day.
- When their infants reached 10–12 months, some participants continued to feed them only three times per day, but increased portion sizes. Others fed their infants between four and six times per day. Only a few reported giving their infants three meals, with snacks in between.

During the discussion of Guideline 6 (“Teach your baby to drink from a cup”), the majority of participants reported using baby bottles for giving water. Some were using a cup –

either a closed cup with a spout and handles or an ordinary open cup. A few used a teaspoon or their hand to offer the water. Opinions varied on when a baby was old enough to start drinking from a cup; opinions included anything between 6 months and 2 years – “when they can walk” or “when they start with solid foods”. One mother reported that they were told at the hospital that a cup could be used from birth when a baby could not be breastfed.

The majority of participants knew how to teach a baby to drink from a cup and demonstrated this by lifting the baby’s head and gently offering water from a cup, or folding the baby’s hands around the cup and assisting them. Some reported that the cup could be given to the baby and they would instinctively know how to use it.

3.4 SUMMARY OF RESULTS

In this chapter, the quantitative and qualitative results, collected from a self-administered socio-demographic questionnaire and from FGDs were interpreted and presented. Twenty-seven participants were involved in the study and data were collected from six clinics, in Soshanguve and Ga-Rankuwa.

Quantitative results were used to compare the socio-demographic profile of participants in Soshanguve and Ga-Rankuwa. Statistical analysis revealed no significant difference. Education level, employment status and housing conditions were considered a good representation of the socio-demographic profile of the population.

Qualitative results revealed that although participants had not yet been exposed to the preliminary PFBDGs, they were familiar with most of the concepts and they were generally well received. Participants revealed valuable information. A discussion of the findings/results and the implications of the results obtained are discussed in Chapter 4.

CHAPTER 4

DISCUSSION OF FINDINGS

4.1 INTRODUCTION

In this chapter, the results of the study are discussed in relation to the aim and objectives of the study (refer to Section 2.2). Qualitative results regarding the participants' exposure to the preliminary 2007 PFBDGs, as well as their interpretation and applicability thereof, will be explained in view of current literature. The possible effect that participants' socio-demographic background may have on their comprehension and applicability of the guidelines will also be discussed.

The study protocol was composed during 2011 and 2012 and field work commenced in 2013. During this time, the 2007 version of the South African PFBDGs was under review, but a publication date for the revised guidelines was not available yet. Due to time and funding constraints to complete the research, it was decided to continue with the testing of the 2007 PFBDGs. Nevertheless, the study results could still be used to evaluate the new 2013 version of the revised PFBDGs and serve as a guide for the testing of thereof. Study findings are therefore also discussed in relation to the revised 2013 set of PFBDGs for the same age category.

4.2 RECRUITMENT AND STUDY SAMPLE

The study sample comprising 27 participants was considerably smaller than formerly conducted qualitative studies that aimed at assessing the preliminary PFBDGs.[11–13] The sample sizes for previous studies varied between 64 and 89 participants, attending between 10 and 20 FGDs. This study aimed at conducting three FGDs per region with between four and fifteen participants per FGD (refer to Section 2.4.2.2), but to continue data collection until a point of saturation was reached. The relative economic welfare and favourable climate of Gauteng not only attracts the local South African population, but also a large number of immigrants from neighbouring countries, resulting in a multicultural group of residents.[74,75] Due to this cosmopolitan nature of the Gauteng population, many clinic attendees during the time of the study were immigrants from other geographical areas and therefore did not meet the inclusion criteria of speaking Northern Sotho, Sepedi

or Tswana as a first language. Consequently, in many of the selected PHC clinics, only a few clinic attendees were suitable candidates. Apart from one clinic where only three voluntary candidates were suitable to take part in the FGD, the majority of the FGDs were attended by between four and six participants. However, concurrent with the WHO/FAO expert panel recommendation to conduct three FGDs per region to gather sufficient information from a representative population,[6] three FGDs were performed in each geographical area. Furthermore, supported by Joubert et al,[70] discussion groups in each area continued until a point of saturation was reached as no new themes emerged. It is unlikely that a larger study sample would have produced new information.

4.3 SOCIO-DEMOGRAPHIC PROFILE OF PARTICIPANTS

The quantitative questionnaire used for this study aimed at gathering information about the participants' personal and socio-demographic background. All participants were female, aged 19–50 years. With the exception of one participant, who was a grandmother and the main carer of the baby, all the other participants were the babies' mothers. Nearly half of the participants were first-time mothers and it could be assumed that their childcare experience, including their knowledge of infant nutrition was limited. The majority were not married and, consequently, financial provision and support for the care of the baby were often raised as barriers to implementing the guidelines.

Quantitative variables used to gather additional information about participants' socio-demographic background were based on previous standardised questionnaires[80] used for community surveys in similar areas. Variables were related to individuals' levels of education, household income and housing conditions, including type of housing, number of people per dwelling, number of rooms per dwelling, and provision and quality of water and sanitation facilities. Household goods such as the presence of a TV, radio, household appliances and provision of postal services were also considered. These variables are generally used to measure standards of living and are indicative of a society's socio-economic circumstances.

Quantitative results indicated no significant difference in the socio-demographic circumstances of the two selected geographical areas. Apart from a significant difference in the number of rooms per dwelling, the areas were comparable. The difference in the number of rooms may be attributed to the different perceptions of a room, e.g. some

people may consider the bathroom as a room whereas other may not. Nevertheless, the average numbers of rooms for both areas were still considered inadequate (refer to Section 4.3.1)

South Africa is classified as a middle-income and developing country with great variations in income, employment status and standards of living throughout the country. Racial inequalities are persistent and socio-economic circumstances between urban and informal rural households are particularly profound. The African population is generally the poorest in the country, with unemployment figures as high as 75%. Many of the poor communities reside in shacks and access to tap water and flush toilets may be limited.[37] The towns of Soshanguve and Ga-Rankuwa are both considered lower socio-demographic urban settings that include a mix of formal and informal housing, with a predominantly African community.[85] Statistical analysis indicated no significant difference between the study results and results of Statistics South Africa Community Survey 2007 with regard to education, employment, housing conditions and possession of household goods.[80] The study population could therefore be considered a good representation of the selected community; home to people with a relatively low socio-demographic background, although not among the poorest in the country.

4.3.1 Housing conditions

Living in satisfactory housing conditions is one of the most important aspects of people's lives. Housing is not only essential to meet basic needs such as shelter; housing is also a place to rest, where people feel safe, and have privacy and personal space. It is somewhere where they can raise a family in a happy, protected and homely environment.[86]

In addition to measuring satisfaction with people's current homes, it is also important to examine living conditions, such as the average number of rooms shared per person and whether dwellings have easy access to basic facilities such as water and sanitation. The number of rooms in a dwelling divided by the number of persons living there indicates whether residents are living in crowded conditions.[86] Although the majority of participants indicated that they were living in a brick house with piped water, sanitation and electricity supply, the living conditions were crowded. The overall number of rooms per number of people was 0.95, with 1.2 rooms per person in Soshanguve and 0.6 in Ga-Rankuwa.

Statistical analysis indicated a significant difference (p=0.01) in the number of rooms per dwelling between the two areas; nevertheless, the average numbers of rooms for both areas were still considered inadequate for the number of people living in the dwelling, when compared to the standards from the Organisation for Economic Cooperation and Development (OECD). Data from the OECD indicate an average of 1.6 rooms per person, with the lowest available figure at 0.9. Overcrowded housing may have a negative impact on physical and mental health, relations with others and children's development. In addition, dense living conditions are often a sign of inadequate water and sanitation services.[86] In South Africa, about 30% of children live in overcrowded conditions, increasing their exposure to sexual abuse and communicable diseases such as tuberculosis and meningitis.[37]

It is evident that the inadequate housing conditions identified among the study population, could put these children's care, health and development at risk. Adequate support and education to mothers and caregivers will be a step in the right direction to improve the health and development of children in this community and in other similar communities in South Africa. The PFBDGs, in particular the 2013 version, once field tested and accepted, can be used as an educational tool to address the aspects of food hygiene, including hand washing, the use of clean water and EBF in these communities, thereby improving the children's nutritional well-being and limiting the risk of communicable diseases. Additionally, EBF could improve emotional well-being of both mother and infant.

4.3.2 Education, employment status and household income

Household income is an important means to achieving higher living standards and thus greater social and physical well-being. Higher economic wealth may not only improve access to better housing and household goods, but also to quality education and optimal health care. A high-income household having above-average wealth will therefore be better off than a low-income household with no wealth at all. It is evident that paid employment has obvious economic benefits, but having a job also helps individuals remain connected with society, build self-esteem, and develop skills and competencies. Societies with high levels of employment are generally more wealthy, more politically stable and healthier. Having a good education greatly improves the likelihood of finding a job and earning well. Highly educated individuals are generally less affected by unemployment trends, as educational attainment makes an individual more attractive in the workforce.

Furthermore, education plays a key role in providing individuals with the knowledge, skills and competences needed to participate effectively in society and in the economy. Education may improve people's lives in areas such as health, civic participation, political interest and happiness. Studies show that educated individuals live longer, participate more actively in politics and in the community where they live, commit fewer crimes and rely less on social assistance.[86]

Unemployment figures in South Africa are amongst the highest in the world, reaching almost 60% in some areas, compared to around 35% globally.[73,86] Worldwide, unemployment rates for those without upper secondary education are considerably higher (around 53%) compared to those for individuals who have achieved a tertiary education level (around 20%).[86]

The study results revealed that less than half (38,5%) of the participants had completed secondary education and a limited number (26,9%) achieved higher education, thereby increasing the possibility of unemployment in this population – as confirmed by the reported lack of income for 20,9% of the participants and supported by figures from Statistics South Africa indicating a 24,7% unemployment rate in Gauteng.[87] Furthermore, the reported household income confirmed the lower socio-economic background of participants. The majority of households in this study earned less than R1 000 per month, thereby positioning them below the median household income of R2 800 and within the bottom 10–25% income range of the South African population (see Figure 4.1).[87]

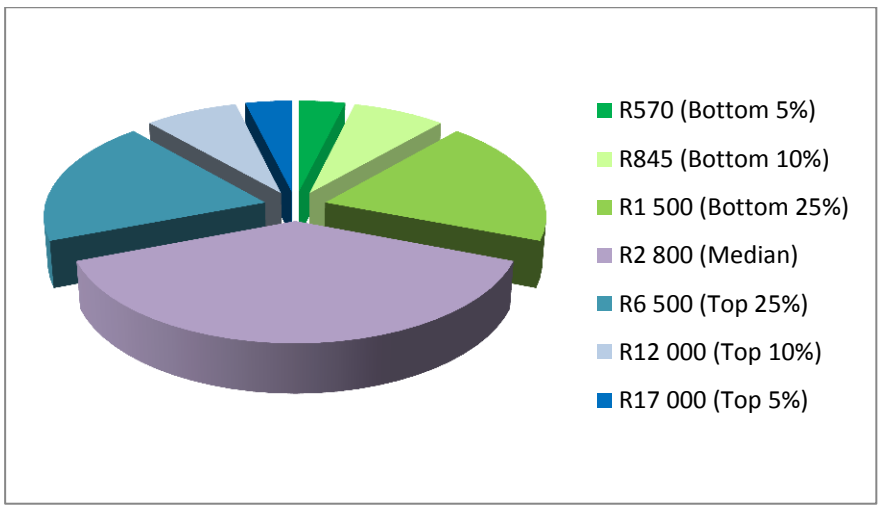


Figure 4.1: Distribution of income in South Africa: monthly household income per percentage of the population[87]

The study population can be described as a low income group with a low level of education, putting them at risk of food insecurity and hunger. As inferred by participants during the FGDs, nutritional adequacy was a major concern among these households that could put their children at risk of malnutrition. Furthermore, the low education levels of mothers and caregivers could unintentionally jeopardise the nutritional quality of their children's diet. Nutrition education tailored for this study group should therefore focus on optimum nutrition at a low cost, i.e. the continuation of breastfeeding and the appropriate introduction of affordable and good quality complementary food. Although the 2007 version of the PFBDGs addressed the aspects of timely introduction of complementary food, meal frequency and continued breastfeeding (guidelines 2, 3 and 4), the 2013 PFBDGs also addressed the aspect of a varied, balanced diet. The 2013 PFBDGs is therefore an improved tool that could be used to empower these mothers and caregivers to make informed food choices to improve the health of their children. Additionally, education on how to be self sustainable by producing nutritious food at a low cost, could further overcome the burden of food insecurity, while maintaining a balanced diet.

4.3.3 Socio-demographic circumstances and nutritional status of children

It is generally accepted that inadequate dietary intake is one of the primary determinants of malnutrition.[38] It was also previously documented that socio-demographic circumstances directly affect the dietary intake and consequently the nutritional status of young children.[31] According to the South Africa NFCS,[31] there is a correlation between a child's nutritional status and socio-demographic circumstances, relating in particular to the mother's and caretaker's education level, housing conditions and possession of household goods. Improved socio-demographic circumstances and especially maternal education is associated with a significant reduction in the prevalence of undernutrition. Although rural settings are mostly affected by these lower socio-demographic conditions and undernutrition, children in informal urban settings with a low socio-demographic background may also be at risk of developing undernutrition. In contrast, the prevalence of overweight is higher in formal urban areas and amongst children who's mothers had obtained higher levels of education.[31,35] However, more recently lower socio-economic groups who still face food insecurity, underweight and micronutrient deficiencies have started to show signs of dietary excess with overweight and obesity, leading to non-communicable diseases. This phenomenon is caused by a shift from previous traditional diets high in whole grains and starch and low in animal proteins, fats and sugar, to a

contrasting Westernised diet. The coexistence of under- and overnutrition is especially evident in the African, poor urban populations of South Africa.[31,37]

The prevalence of underweight combined with overweight/obesity poses a challenge to implement effective nutrition programmes to decrease the prevalence of both conditions. Considering the lower socio-demographic circumstances along with the mixed formal and informal urban settings in the areas of Soshanguve and Ga-Rankuwa, this population would probably be affected by the emerging nutrition transition and the double burden of under- and overnutrition. For the PFBDGs to be used as an effective educational tool in these and other similar communities, it would therefore need to address both issues. The 2007 version of the PFBDGs did not address these nutritional aspects, a limitation that was identified and incorporated in the revised 2013 PFBDGs. The revised guidelines included guidance on responsive feeding and low fat and low sugar consumption, along with guidance on a varied and balanced diet.

4.4 FOCUS GROUP DISCUSSIONS

4.4.1 Exposure to the preliminary PFBDGs

Participants were unfamiliar with the term “food-based dietary guidelines”, nevertheless they recognised most of the concepts embedded in the guidelines. Exposure to the familiar concepts was mainly via hospitals and health care clinics. Family and friends also contributed to some exposure, whilst the general public and the media were less significant sources of information. The study population relied greatly on the PHS for the delivery of information concerning the care of their infants. A previous assessment of the PFBDGs undertaken by Scott et al[12] identified that middle and upper socio-economic groups relied more on the media (including books and magazines) as a primary information source.

The history of the South African health services has had a considerable effect on the health of its people and the current provision of health services. Previously, during the apartheid[9] period, society was structured according to race and gender with racially

[9] *Apartheid = A former policy of racial segregation including political and economic discrimination against non-European groups in the Republic of South Africa*[88]

segregated health services. Access to health services was unequal, with fragmentation within the public health sector and between the public and private sectors. Although there has been considerable improvement in transforming institutions such as health facilities, South Africa still faces many challenges in improving equal access to health services. Failures in leadership and weak management have led to inadequate implementation of what are often good policies and there is a substantial human resources crisis facing the health sector. The HIV epidemic has contributed to and accelerated these challenges. In order to resolve these health inequities and access to health care, improved management and distribution of resources along with increased spending on public health, education and social services is required (see Figure 4.2). The current unfavourable economic conditions, locally and worldwide, is only one of the many challenges faced by the government.[76]

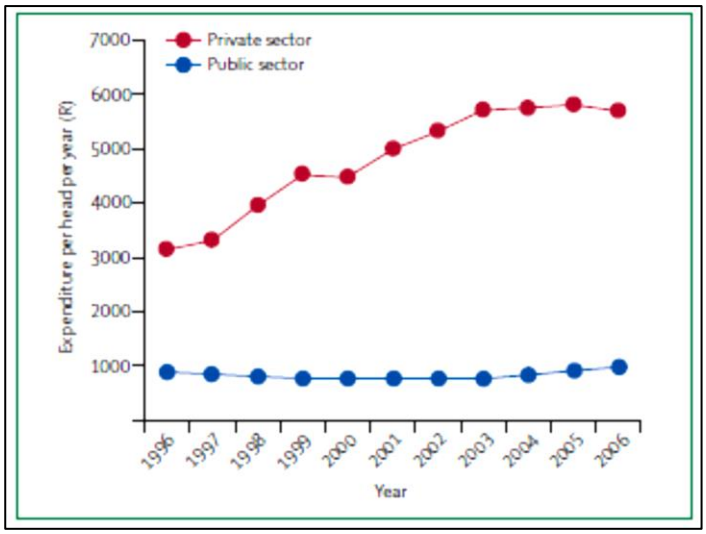


Figure 4.2: Health care expenditure in South Africa's public and private sectors[76]

Considering that health intervention programmes at public health facilities may be the primary information source for lower socio-economic groups, unequal access to these facilities may have a significant effect on the exposure to health messages such as the FBDGs.[76] Community-based health intervention programmes should therefore be well planned and monitored to ensure the level of understanding is appropriate and access is sufficient to reach the target population, i.e. the lower socio-economic groups. Furthermore, nutrition messages conveyed by health care staff in public health facilities should be consistent. Although the FBDGs can form the basis of nutrition communication, it is also essential that health care staff should be well trained to enable them to transfer these messages in a standardised and meaningful way. In addition to the FBDGs, further

educational materials and -programmes may be required to address specific target groups and their particular needs.[7]

4.4.2 Interpretation and application of each preliminary PFBDG

Focus groups discussions were initially planned to last for 60–90 minutes, however during the pilot study the investigator noticed that if the discussion lasted longer than 60 minutes the participants lost interest towards the end of the discussion and responses diminished. Discussions were consequently limited to less than 60 minutes. During a previous assessment of PFBDGs,[12] the investigator experienced a similar scenario where participants from a lower socio-economic group had shorter discussions than those from upper and middle class socio-economic groups. This was attributed to the lower education levels of participants of the former group. This was also experienced in a study by Coveney. The discussions of lower socio-economic groups were considerably shorter in time, their knowledge and use of scientific terminology were limited, and consequently discussion were less detailed than for higher socio-economic groups.[89] In the performed study, the low educational status of participants, may also have been a contributing factor for the misinterpretation of some of the phrases used to describe the preliminary PFBDGs and consequently resulted in shorter, less detailed discussions.

The discussion below (Sections 4.4.2.1–4.4.2.7) reflects the responses of participants regarding their interpretation and application of each of the 2007 version of the preliminary PFBDGs and how the results of this study and other assessments of the 2007 PFBDGs were incorporated in the revised 2013 PFBDGs.

4.4.2.1 Guideline 1: “Enjoy time with your baby”

Participants understood the concept and accepted that loving and caring formed part of enjoying and spending time with their infants. This could also be confirmed by the fact that mainly the mothers themselves brought their infants to the clinic. However, the stress caused by the lack of income, support and knowledge emerged as a barrier for this low socio-economic group to fully “enjoy” time with their infants, which may ultimately impose risks on the health and development of their infants. Furthermore, mothers were mostly unable to relate the concept of the enjoyment and time spent with their infants to feeding practices, leading to confusion and a misconception of the message aimed to be delivered via this guideline.

The provision of food does not stand alone when the nutrition of a child is concerned. It is the role of the mother or caregiver to actively interact and "enjoy" their baby to provide adequate care and nutrition. Nutrition is intimately linked with psychological well-being including caregiver sensitivity, psychosocial support or communicative exchange between the infant and caregiver.[49] The behaviour of parents or caregivers during feeding time may therefore directly affect the quality and quantity of the food consumed by the child.[90] Infants and young children are unable to regulate their intake and caregivers need to understand their ways of communicating and act accordingly to be able to provide all aspects of optimal care, including feeding. Apart from receiving inadequate nutrition, infants may also be affected emotionally when their caregiver is unable to react appropriately to their cues.[49]

Furthermore, the benefits of breastfeeding support many aspects of optimal care to maintain health and development during childhood. Apart from providing optimal nutrition, one of the strongest benefits of breastfeeding is how it contributes to the mother-infant interaction and fulfilling the need of affection and protection for both baby and mother.[90] Promoting breastfeeding as part of "enjoying time" with their baby should improve the perception of this guideline.

The revised 2013 PFBDGs removed this particular guideline, but addressed the aspect of emotional and interactive care in the guidelines pertaining to responsive feeding ("Feed slowly and patiently and encourage your baby to eat, but do not force him or her") and continued breastfeeding (see also Sections 1.6.1, 4.4.2.3 and 4.4.2.4).

4.4.2.2 Guideline 2: "From 6 months, start giving your baby small amounts of solid foods"

Exclusive breastfeeding followed by optimal complementary feeding from 6 months of age, whilst breastfeeding continues for up to 2 years and beyond, will contribute to a child's optimal nutrition.[41] The untimely and inappropriate introduction of complementary foods has been found to be a risk factor of over- and undernutrition.[41,42,54,91] In South Africa, only a small percentage of infants is exclusively breastfed up to the age of 6 months. The majority of infants in both rural and urban areas receive solid foods at around the age of 4 months; some may even be introduced to solid foods before the age of 3 months.[54]

A longitudinal study performed on healthy infants born in Kalafong Government Hospital observed a decrease in growth performance associated with inappropriate introduction of complementary foods.[91] Kalafong is situated in Attridgeville, a town west of Pretoria CBD. Similar to the areas of Soshanguve and Ga-Rankuwa, the majority of infants in the surrounding areas of Kalafong Hospital are from urban or rural economically disadvantaged communities. Complementary foods were recorded as having been introduced from as early as 1 month of age and at 3 months 65% of the infants of participants had already been introduced to complementary foods. The variety of these foods was limited and the nutritional value was insufficient. [91]

In another study, conducted by Faber et al,[42] data were collected on breastfeeding and complementary feeding from 265 mothers with infants. Data were obtained by a questionnaire from two South African communities, one urban (Kayamandi, Western Cape) and one rural (Ndunakazi, KwaZulu-Natal), both with low socio-economic circumstances. The study also identified the early introduction of complementary foods with low nutritional value and limited variety. [42]

The above studies conducted amongst lower socio-demographic groups in South Africa can be associated with the outcomes of the performed study. Participants generally agreed with the principle of introducing small amounts of solid foods at the age of 6 months, reporting that a baby's digestive system would be "functioning well enough to receive solids" at this age. However, some were still influenced by individual perceptions and cultural opinions, especially from the older generation. They reported that solids were introduced from as early as 5 days after birth and lack of awareness existed of the health-related risks of inappropriate complementary feeding practices. This supports the findings of previous publications indicating that incorrect advice from relatives and friends and the mother's lack of knowledge may initiate the belief that breast milk alone is not sufficient to satisfy the infant and are the main barriers to the timely introduction of solids foods.[42,55]

First foods commonly introduced by participants had soft, smooth textures. "Small quantities" were perceived differently, varying between 1 teaspoon and 1 bowl. Although "responsive feeding" was not used as a common term, responses reflected some knowledge of feeding on demand, coherent with the WHO recommendations that the amount of complementary foods should not be overly prescriptive.[41] However, there was a

tendency to overfeed or even force-feed younger infants, with the perception that a baby should eat “well”.

Soft cooked maize porridge or commercial baby cereal mixed with milk or water was mainly used as a first food for infants. Maize porridge remained the staple through to 12 months, but the consistency became more firm as the child grew older. In some cases, margarine or sugar was added to the porridge. At approximately 8–10 months, other foods such as mashed vegetables, packets of soup mix and commercial fortified infant puréed food were also added. Regular fruit and vegetable consumption was limited and proteins (including meat and fish) were regarded as inappropriate by almost all of the participants, which concurred with the results of the study by Faber et al.[42]

This complementary diet, typical for lower-socio economic groups in South Africa, may provide adequate energy (especially when margarine or sugar is added to maize), but previous studies and national surveys demonstrated that the nutrient composition is inadequate, especially with regard to iron, selenium, zinc and calcium and several vitamins including vitamins A, B_2, C, D and E.[31,56] Furthermore, the increasing prevalence of overweight, especially amongst the children in urban areas and those with higher educated mothers,[31] should not be overlooked in terms of energy intake and nutritional quality.

Commercial baby food, including fortified infant cereal and fortified infant purées, might seem like a good feeding practice to provide more nutrients, however, for low socio-economic groups it may be an expensive product. Faber et al[42] found that, due to their high cost, these products may often be prepared incorrectly by using too little dry product with too much liquid, or the total quantity of the product given may be very small, subsequently putting infants at risk of malnutrition.

The food consistency reported by participants to be appropriate for babies aged 6–12 months was mainly limited to mashed food, with a biscuit or “teething biscuit” introduced at approximately 9 months. Only one respondent reported to be offering her baby chopped family meals at the age of 12 months. The untimely exposure of appropriate food textures during infancy may lead to long-term feeding problems, including the insufficient consumption of important food groups, subsequently putting the child at risk of developing malnutrition.[43]

The revised 2013 PFBDGs address the introduction of complementary foods focusing on different aspects that may help to overcome misconceptions and inappropriate practices. The more specific messages included in the revised guidelines, may help to improve the quality of education provided to caregivers and thereby improve the appropriateness and nutrient content of the infant's diet. Apart from the recommendation of introducing small amounts of solid foods at the age of 6 months, the revised guidelines also contain information on how to overcome nutrient deficiencies by suggesting the regular intake of protein-rich foods from 6 months of age as well as a variety of fruit and vegetables (refer to Section 1.6.1). Furthermore, food and drinks high in fat, sugar and salt are discouraged to prevent overweight, obesity and NCDs ("Avoid giving tea, coffee and sugary drinks and high-sugar, high-fat salty snacks to your baby") as well as addressing undernutrition by preventing the displacement of nutrients in the infant's diet by consumption of these drinks. Aspects of appropriate quantities and food textures are also addressed with the addition of the guideline: "Start spoon-feeding your baby with thick foods and gradually increase to the consistency of family foods".

4.4.2.3 Guideline 3: "Gradually increase your baby's meals to five times a day"

Not many participants were familiar with the concept of this guideline and struggled to interpret its meaning. Previous FBDG studies,[10,13] reported similar findings – stating a misinterpretation of the terminology, rather than the concept. Most participants did not differentiate between a snack and a meal, and reported that they did not offer their babies five "meals" per day. Concerns were raised that an increased number of meals may become unaffordable. However, after probing, it appeared that generally small amounts of food were initially introduced and gradually increased as the infant grew older. The majority of participants seemed to be feeding their infants between three and five times per day.

Changes to the phrasing of the guideline were suggested such as "how many meals are needed at what age" and to differentiate between a "snack" and a "meal". It was also suggested that responsive feeding be addressed and encouraged in the guideline. This was considered a very appropriate recommendation, considering that the revised PFBDGs also address this matter. As previously discussed in Section 4.4.2.1, responsive feeding practices may improve the quantity and quality of an infant's diet. Apart from the emotional benefits of responsive feeding, it is also considered the foundation of healthy eating

through the development of a child's skills to self-regulate the intake of food, thereby minimising the risk of feeding problems and malnutrition.[58]

Rephrasing of this guideline by using carefully selected and more explicable terms will help to prevent misinterpretation. In addition, this guideline may also need educational material to address the following nutritional principles:

- Raising awareness of the importance of offering a small, frequent intake of nutritious food to accommodate the infant's small stomach capacity.[5,7]
- Emphasising the importance of energy and nutrient dense food to meet the growing infant's requirements and encouraging self-feeding snacks between meals for older infants.[5,7]
- Encouraging responsive feeding practices by slowly and patiently feeding an infant, without forcing them.[5]

Again, the revised PFBDGs address these issues with the addition of guidelines and the rephrasing of concepts to improve their understanding. Explicit wording such as "Gradually increase the amount of food, number of feeds and variety as your baby gets older" may overcome the misconceptions identified during the study. The guidelines pertaining to protein-rich foods, a variety of fruit and vegetables, and the avoidance of a high fat, sugar and salt intake will address the nutritional quality of meals, whereas responsive feeding is specifically addressed in a separate guideline, as discussed in Section 4.4.2.1.

4.4.2.4 Guideline 4: "Keep on breastfeeding your baby"

Guideline 4 was the most familiar and commonly accepted guideline. The actual breastfeeding of participants during FGDs confirmed this. The majority of mothers reported to predominantly breastfeed their infants and their understanding that breast milk was best for a baby concurs with the WHO guidelines.[59] Breastfeeding was further appropriately accepted as a natural, safe and cost-effective way of providing optimum nutrition to the baby and may help to prevent illness and dehydration. Only some participants were using a breast milk replacement formula in addition to breast milk or as a substitute, particularly those who were working and unable to be with their infants all the time. Breast milk replacement formula was regarded by most participants as an alternative, should the mother be unable to breastfeed. The main reasons provided for the discontinuation of breastfeeding were mothers returning to work or mothers living with HIV.

Generally, the desire to protect their child and the fear of mother-to-child transmission is one of the main reasons stated by HIV-positive mothers for deciding against breastfeeding. However, these fears of HIV transmission through breast milk often result from information that overestimates this risk. Postpartum care and support for HIV-positive mothers, specifically strategies to increase exclusive infant feeding practices, is an issue that needs to be addressed with additional supportive information material to complement the PFBDGs and with separate and specific interventions programmes.[92]

The actual number of participants who exclusively breastfed their infants up to 6 months of age was questionable. Although participants were familiar with the concept and agreed with it in principle, it was evident that some participants introduced solid foods before the age of 6 months and many other participants questioned the rationale for this requirement. Some participants did report that, from an early age, breast milk alone was considered, especially by the older generation, as being insufficient. Considering the results from previous studies (refer to Section 4.4.2.2)[42,55,91] indicating high incidences of the early introduction of complementary foods, it may well be accepted that EBF for the first 6 months of life in this particular lower socio-economic group is also sub-optimal.

However, the fact that mothers are reporting the correct message is a step in the right direction. A variety of psycho-social aspects may affect a person's behaviour and they often go through stages before a change in their behaviour is accomplished. A thought process of weighing up the pros and cons is usually followed by a stage of preparation, before embarking on an action of change. The environment in which someone lives, as well as their attitudes, beliefs, learning styles, social, cultural, religious and economic situation have a major influence on their health behaviour. Different approaches at different times may therefore encourage change in different people. An integrated approach, by treating the communities in a holistic manner and taking into consideration their environment, may over time encourage a change in their health behaviour.[93] Healthcare practitioners should therefore keep on reinforcing this message, by using appropriate intervention programmes and approaches, until behaviour change in this regard is effected.

The majority of mothers reported that they would consider the continuation of breastfeeding well beyond 6 months of age. Some thought that breastfeeding should continue up to 1 year or 18 months, but the majority reported that it was appropriate up to

the age of 2 years. Although they agreed with the continuation of breastfeeding, they regarded this as a personal choice and were not familiar with any guidelines pertaining to this advice. The study results indicating the continuation of breastfeeding were in contrast with previous PFBDG studies,[10,13] which reported that although a large number of participating mothers initiated breastfeeding after birth, they were unable to continue mainly due to the milk being considered as inadequate. National data indicated that the initiation rates of breastfeeding remained high at around 88%, but thereafter breastfeeding figures rapidly declined before the baby reached 6 months of age when they were either mixed fed or formula fed.[94] Moreover, the vast majority of higher socio-economic groups in South Africa tend to introduce formula milk directly after birth, especially those who return to work, receive paternal support with feeding and consider the availability of public facilities as being inadequate and lacking in privacy.[95] The reason for the discrepancies in the continuation of breastfeeding between the national data and the current study is unknown and may be due to the small sample size of the performed study. Further investigation will be required to clarify this.

The aspects of EBF for the first 6 months of life and the continuation of breastfeeding to 2 years of age and beyond are both concisely addressed in the revised PFBDGs, i.e. “At six months start giving your baby small amounts of complementary foods, while continuing to breastfeed to 2 years and beyond.”

The FBDGs are aimed at healthy individuals and a concept that cannot be addressed in the PFBDGs is therefore the continuation of breastfeeding during illness. During illness, the baby’s need for fluids is often higher than normal. Sick children appear to prefer breast milk to other foods and continued, frequent breastfeeding during illness should be encouraged.[41] Supplementary material supporting the PFBDGs may be required to address the importance of breastfeeding during illness in these communities, as it was a concern often raised by participants.

4.4.2.5 Guideline 5: “Offer your baby clean, safe water regularly”

The majority of participants had been exposed to this concept and were familiar with the importance of offering clean or safe water to their babies. However, uncertainty relating to the difference between the terms “clean” and “safe” water existed and the meaning of the term “regularly” caused confusion with other interpretations such as “always” or “sometimes”.

Appropriate water for an infant was considered to be tap or running water, stored in a clean, closed container. Some participants reported that they used only boiled water, but many were totally unaware of this requirement. Others reported that they did not use boiled water all the time, as it was impossible when they were out on the street or unable to afford or construct a heat source. Only one participant was aware that household bleach could be used to purify water, although an incorrect concentration was described, i.e. 1 teaspoon per 5 litres, instead of the recommended 1 teaspoon per 25 litres.[96] Water purification appeared to be a practical hindrance and a low priority amongst the participants. They were more concerned about practical recommendations on when to start giving water and how often it was needed.

Other liquids generally offered to participating infants, apart from water and milk, included occasional tea/rooibos tea and/or juice (full strength or diluted). Tea/rooibos tea is not recommended for infants, due to their low nutrient value and the polyphenol content; the latter inhibits iron bioavailability, which may lead to anaemia.[97] Fruit juice should be limited for infants (6–12 months old) and children, as excessive amount of juice can displace nutrient-dense food in the diet and increase the risk of dental caries. Diluted juice can however obviate this to an extent.[98]

The socio-demographic data collected during this study and in other surveys[31,80] indicated that many households in the lower socio-economic areas of South Africa do not have access to piped water and sanitation inside their house. When water is not available inside the house, the water collected from outside may become contaminated before consumption, and hand washing may also be less frequent.[65] The WHO Guiding Principles for Complementary Feeding of the Breastfed Child[41] suggests that attention to hygiene during food preparation and feeding is critical for prevention of gastrointestinal illness. Although there are significant barriers to compliance with the above recommendations in many settings (such as lack of safe water and facilities for safe preparation and storage of food or time constraints for the caregivers), carefully planned educational interventions can result in substantial improvement.

The aspect of food hygiene and sanitation was not specifically addressed in the preliminary 2007 PFBDGs. Educating mothers in the community to raise awareness about the importance of hygiene and to improve safe food handling and safe complementary

feeding practices, is a key to prevent diarrhoea in infants and young children. Health care facilities are a primary source of information for the study population and perhaps for many other South Africans. Training of health care staff in providing appropriate food safety and hygiene advice to clinic visitors is therefore a priority. Mothers and caregivers have the responsibility to convey these messages to their children and to demonstrate good food handling and hygiene practices. Hands and fingers are a substantial transmission route and hand washing of both caregiver and child before feeding or food handling is important. Although washing with water alone may reduce the prevalence of diarrhoeal disease, hand washing with soap and water is more effective.[63] The revised 2013 PFBDGs therefore include an additional guideline: "Hands should be washed with soap and clean water before preparing and eating food."

Breast milk constitutes of almost 90% water,[67] thereby providing sufficient fluid in addition to optimal nutrition if fed frequently and/or on demand. Furthermore, breast milk improves the immune system, it is safe and sterile, and reduces exposure to food and water-borne organisms.[14,47] Infants who are frequently breastfed are consequently less likely to become dehydrated or infected by infectious diseases. The importance of fluid intake and specifically breast milk as the primary source of fluid for infants is addressed in the revised PFBDGs with the guideline pertaining to the continuation of breastfeeding (refer to Section 4.4.2.4). Addition of an additional guideline to the revised PFBDGs: "Avoid giving tea, coffee and sugary drinks and high-sugar, high fat salty snacks to your baby," would address the inappropriateness fluids other than milk and water.

The uncertainty of what was considered safe water for an infant and the use of safe water during hot climate conditions to prevent dehydration has not been addressed via the PFBDGs. This could be included in educational material supporting the PFBDGs. The new RtHB however, includes guidelines on oral rehydration therapy and fluid provision.

4.4.2.6 Guideline 6: "Teach your baby to drink from a cup"

Many participants were unfamiliar with this guideline and failed to recognise the rationale behind this recommendation. Teaching their babies to drink from a cup would be acceptable, but it was not typically done. Bottles and feeding cups were more generally used when additional liquids were offered. Diverse opinions existed around which kind of cup was most suitable, e.g. an open vs. a closed cup, or a cup with or without handles.

Perceptions on when a baby was old enough to accept an open cup also varied from anything between 6 months and 2 years, or at the time when they started walking. Participants suggested that this guideline should be adapted to address the appropriate age at which cup-feeding should commence and the types of cups considered appropriate. In addition, stating the reasons for introducing cup-feeding would promote implementation.

Cup-feeding is considered more hygienic than bottle-feeding and may prevent the exposure of children to food and water-borne diseases (refer to Section 4.4.5).[63,68] In addition, cup-feeding (as opposed to bottle-feeding) may help to prevent dental caries, improve oral muscle development and prevent nipple confusion (refer to Section 1.6.1).[68] Nevertheless, breastfeeding remains the ideal way of feeding a baby and should be encouraged as the preferred option before considering any other way of feeding liquid to an infant.

Cup-feeding as such was omitted from the revised set of PFBDGs; however, the guidelines pertaining to hygiene and breastfeeding (refer to Section 4.4.2.5) indirectly address the advantages of cup-feeding as opposed to bottle-feeding and additional information will need to be included in support material for the revised PFBDGs.

4.4.2.7 Guideline 7: "Take your baby to the clinic every month"

This guideline was well understood, accepted and implemented by the majority of participants. They felt that it was necessary for the babies to be monitored for growth and development and to receive immunisation for the prevention of diseases, and for the mothers/caregivers to receive education on rearing a child. A little confusion existed, however, around when monthly visits were no longer required. Suggestions were made for this guideline to be adapted, specifying the number of visits needed at specific ages. All participants agreed that a local, accessible clinic was suitable, but dissatisfying long waiting times at the clinic was raised as a concern by almost all the participants.

Regular clinic visits are important to monitor a young child's growth and development in order to detect and address any growth failures and health issues at an early age.[10] Clinic visits are furthermore required to ensure an infant receives its full course of immunisation to protect them against preventable diseases and to provide education to mothers about the appropriate care of their child. The revised PFBDGs do not address clinic visits. Although regular monitoring of an infant may help to identify nutrition-related diseases or

deficiencies, clinic visits are not directly food-related or considered a “dietary guideline.” As an alternative, the new RtHB incorporates guidance around required immunisation and in particular at what age immunisations are required, in addition to indications of when routinely clinic visits are recommended.

4.5 SUMMARY OF DISCUSSION

None of the participants had previously been exposed to the FBDGs, but the majority were familiar with most of the concepts embedded in the guidelines. These concepts were previously introduced to them mainly via health care facilities and, to a lesser extend, via families, friends and the media. In general, the guidelines were well received and understandable, but a few guidelines were misinterpreted. Rephrasing of these guidelines, the use of more explicit terms and providing additional advice to support the guidelines may encourage and improve the understanding of the FBDGs, and the practical application thereof.

These findings were similar to previous assessments of the preliminary 2007 PFBDGs that were taken into consideration with the development of the revised 2013 PFBDGs. The performed study therefore confirmed the effective use of available research for the process of development and adaptation of an evidence-based set of revised PFBDGs published in 2103. Further testing of the 2013 PFBDGs is required to determine if these changes were appropriate to effectively address and eliminate previously identified concerns and if these guidelines could effectively be used as an educational tool to assist health care workers in facilitating change in the health behaviour of different communities.

It can further be assumed that a possible trend exists between the socio-demographic circumstances of the participants and their exposure to and their comprehension and application of the guidelines. Participants’ exposure to guidelines was different compared to in previous studies where higher educated mothers received information mainly via the media. Furthermore, lower levels of maternal education may have resulted in shorter, less detailed discussions and the misinterpretation of some concepts and terms. With regard to the practical application of the guidelines, a lack of income and support was often identified as a hindrance in the application of a guideline, but in some cases lower socio-demographic circumstances was the reason for more favourable application, e.g. the continuation of breastfeeding. Socio-demographic circumstances may therefore not only

affect the understanding of the PFBDGs, but also the change in health behaviour. An integrated approach and the reinforcement of consistent messages adapted for different communities may therefore raise awareness and ultimately encourage a change in their health behaviour. The findings of the performed study therefore confirmed the requirement of additional supportive educational material and training of health care staff to enable them to effectively transfer PFBDGs messages tailored for different communities.

These findings constitute the core of the recommendations to be made for future testing and adaptation of the revised PFBDGs, as discussed further in Chapter 5.

Table 4.1 summarises the differences in the two sets of PFBDGs and recommendations for future testing.

Table 4.1: Comparison of the two sets of PFBDGs and recommendations for future testing and utilisation

The 2007 Version of the preliminary PFBDGs for infants 6-12 months of age		**The 2013 version of the revised PFBDGs for infants 6-12 months of age**	**Additional supportive educational material required and recommendations for future testing of revised 2013 PFBDGs.**
From 6 months start giving your baby small amounts of solid foods	**Replaced with:**	At six months start giving your baby small amounts of complementary foods, while continuing to breastfeed to two years and beyond.	Additional supportive material required to address: - The continuation of breastfeeding during illness - Breastfeeding for mothers living with HIV/AIDS.
Keep on breastfeeding your baby			
Gradually increase your baby's meals to five times per day	**Replaced with:**	Gradually increase the amount of food, number of feeds and variety as your baby gets older.	Future assessments of the revised 2013 PFBDGs may have to enquire if confusion that existed around the appropriate number of feeds and snacks required will be omitted with the revised guideline.
Enjoy time with your baby		Feed slowly and patiently and encourage your baby to eat, but do not force him or her.	Additional supportive material may be required to address emotional and interactive care.
		From six months of age, give your baby meat, chicken, fish or egg every day, or as often as possible.	

		Give your baby dark-green leafy vegetables and orange-coloured vegetables and fruit every day.	
		Start spoon-feeding your baby with thick foods, and gradually increase to the consistency of family food.	Additional supportive material may be required to advise on appropriate textures at various ages between 6 and 12 months.
Offer you baby clean safe water regularly	**Replaced with:**	Hands should be washed with soap and clean water before preparing or eating food.	
		Avoid giving tea, coffee and sugary drinks and high-sugar, high-fat salty snacks to your baby.	- Supportive material may be required to ensure the use of safe drinking water for infants. - The PFBDGs should be used in conjunction with the RtHB to advise on precautionary actions to prevent dehydration. - Additional supportive documentation may be required to encourage cup feeding and avoid bottle feeding.
Teach your baby to drink from a cup			
Take your baby to the clinic every month		Omitted from revised PFBDGs	The PFBDGs should be used in conjunction with the RtHB to encourage regular clinic visits.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The literature review (Chapter 1) confirmed the need for the development of country-specific FBDGs to address local nutrition-related public health issues in South Africa. The high incidence of malnutrition, in particular stunting, together with the increasing prevalence of overweight and obesity amongst children, also needed to be addressed. A working group consequently developed three sets of preliminary PFBDGs for different age and developmental categories. Consumer testing later culminated in a revised set of PFBDGs that was published in 2013.

The study protocol was composed during 2011 and 2012 and field work was performed in 2013, prior to the release of the revised set of PFBDGs in 2013. The aim of this study was to assess the exposure, understanding and practical application of the 2007 preliminary set of PFBDGs for infants aged 6–12 months. Study findings were considered and are discussed in relation to the revised set of 2013 PFBDGs for the same age category, to be used as a guide for future testing of the revised guidelines.

5.2 SUMMARY OF RESEARCH FINDINGS AND CONCLUSIONS

Focus group discussions were conducted to collect qualitative information regarding participants' exposure, understanding and application of the preliminary 2007 PFBDGs for infants aged 6–12 months. Mothers who attended their local health centre clinics were generally receptive towards the idea of discussing their infants' nutrition and gladly participated in the FGDs. The testing, adoption, promotion and implementation of new revised PFBDGs may therefore be well received and accepted by the public.

Although participants had not previously been exposed to PFBDGs specifically, they were familiar with most of the concepts thereof. In some cases, concepts were initially perceived as unfamiliar but this was mainly due to inadequate phrasing leading to the misinterpretation of the message. Guidelines pertaining to enjoying time with their babies, increasing their baby's meals to five times per day and cup-feeding were less familiar, but

with further explanation participants later also recognised and understood these concepts. Participants generally obtained their knowledge of infant feeding mainly from health care professionals at health care facilities such as hospitals and PHC clinics. Participants confirmed that attending health centre appointments was important for them to gather reliable information on the care (including nutrition) of their babies. Apart from this information source, participants also considered friends and family as influential factors for making decisions pertaining to infant care and nutrition. Although cultural pressure and beliefs of older family members may influence the practical application of some guidelines, e.g. “Guideline 2: From 6 months, start giving your baby small amounts of solid foods”, participants were still aware of the correct recommendations advocated by professionals at health care facilities and respected them as a trusted source of information, which is a step in the right direction towards changing their behaviour. Behaviour change should be considered as a key focus when promoting the revised PFBDG. Healthcare practitioners should therefore keep on reinforcing messages, by using appropriate intervention programmes and an integrated, holistic approach, until behaviour change in this regard is effected.

The socio-demographic circumstance and level of education probably affected the quality and length of the discussions. Some participants were evidently more educated than others and had a better understanding of nutrition and the concepts of each guideline. These participants were more outspoken and provided more detailed responses. They also appeared more relaxed with their infants and may find it easier to conform to the guidelines. Participants who were less educated sometimes appeared confused and required more detailed explanations with some concepts. Misinterpretation and misunderstanding the guidelines may lead to incorrect feeding practices or abandoning them altogether. Although some hindrances such as the lack of support and income and lower levels of education may prevent mothers complying with the guidelines, PFBDG suited to their level of understanding may still provide guidance and may gradually lead them to improved nutrition and health for their infants.

This study supports the findings of previous assessments of the preliminary PFBDG[10–13] in that most of the concepts contained therein were well received, easy to understand, generally culturally acceptable and practical. Elaboration and some additional explanation, along with the rephrasing of some guidelines, as has been done in the revised set of guidelines, may overcome some misinterpretations. Use of the PFBDGs in addition to

other educational material, the further training of health care professionals and promotion of health campaigns may improve the comprehensibility thereof and ultimately improve the nutritional knowledge of the public. The socio-demographic characteristics of South Africa's diverse population are a considerable influencing factor for the adjustment and implementation of future guidelines, in order to suit the diverse population and address the disparate nutritional issues in the country. A single set of well-developed and field-tested guidelines would be a valuable tool in educating mothers about feeding their infants.

The interim development of the revised set of PFBDGs for infants aged 6–12 months considered the recommendations of the previous consumer assessments. The guidelines are consistent with the findings and recommendations of this study. The importance of addressing the coexistence of under- and overweight in lower and higher socio-economic groups were noticeably taken into consideration. The aim of the revised PFBDGs is to serve as a nutrition education tool used by educators such as health workers or teachers in conjunction with other education tools, to educate and empower mothers and caregivers in providing optimum nutrition for their infants. Further field testing of the revised guidelines is now required before final adoption and implementation can commence.

5.3 RECOMMENDATIONS FOR EACH PFBDG

5.3.1 Guideline 1: "Enjoy time with your baby"

The provision of food does not stand alone when the nutrition of a child is concerned. Nutrition is intimately linked with the infant's psychological well-being and the mother or caregiver needs to actively interact and "enjoy" their baby to provide adequate care and nutrition. This guideline was initially misinterpreted and required rephrasing to improve the understanding. In the revised PFBDGs this particular guideline was removed and appropriately addressed the aspect of emotional and interactive care with the guidelines pertaining to responsive feeding and breastfeeding. These two guidelines are interrelated, and educators and trainers will need to understand the importance of mother-child interaction and how it may influence an infant's nutritional status and well-being, as it could easily be omitted during education.

5.3.2 Guideline 2: "From 6 months, start giving your baby small amounts of solid foods"

This guideline was well understood, but cultural influences affected the timely introduction of complementary foods and confusion existed around appropriate foods for an infant. The revised PFBDGs address the introduction of complementary foods via different aspects (see Section 4.4.2.2) and guidelines, which may help to overcome misconceptions and inappropriate practice concerning the timely introduction of solids as well as the quality, quantity and consistency of complementary foods. Supportive educational material may be needed to explain the health risks associated with non-compliance, especially considering the timely introduction of solid foods to overcome inappropriate cultural influences. Guidelines may also need to be adjusted for different socio-economic groups to consider the availability and affordability of high-quality complementary foods.

5.3.3 Guideline 3: "Gradually increase your baby's meals to five times a day"

The majority of participants misinterpreted this guideline and required further explanation to understand the concept of five "meals". Previous FBDG studies[10,13] reported similar findings, stating a misinterpretation of the terminology, rather than the concept, and recommended rephrasing of this guideline. This recommendation was also confirmed in this study. The revised PFBDGs effectively addressed this issue with the addition of guidelines, while also addressing the aspect of responsive feeding. This guideline may also need to be adapted for different socio-economic groups, as food affordability and availability were identified as possible hindrances to the provision of high-quality meals and snacks several times per day.

5.3.4 Guideline 4: "Keep on breastfeeding your baby"

Guideline 4 was very well understood and needed no further explanation. Education regarding this guideline should reinforce EBF for the first 6 months of life, in conjunction with the timely introduction of complementary foods whilst continuing breastfeeding up to 2 years of age and beyond. The revised PFBDGs effectively address all these aspects.

5.3.5 Guideline 5: "Offer your baby clean, safe water regularly"

Participants were generally aware of the requirement to offer safe water to their children, but lack of knowledge and other socio-demographic circumstances, including lack of required facilities, were identified as barriers to complying with this guideline. Education covering the importance of food hygiene and sanitation will need to support this guideline to improve practical application. Encouraging the continuation of breastfeeding along with the revised PFBDGs pertaining to hygiene and sanitation may raise awareness of the importance of this aspect in the prevention of disease. The revised PFBDGs also address the inappropriateness of other fluids apart from breast milk and water to support the continuation of breastfeeding.

5.3.6 Guideline 6: "Teach your baby to drink from a cup"

Cup-feeding was an unfamiliar concept amongst the participants. Bottles and feeding cups were more generally used when additional liquids were offered. This guideline mainly addresses the aspects of food hygiene and the disadvantageous of bottle-feeding. The addition of cup-feeding as a guideline may cause confusion and perhaps influence the decision to continue breastfeeding. In the revised PFBDGs this guideline was appropriately omitted and the issue was addressed via the guidelines pertaining to food hygiene and the continuation of breastfeeding.

5.3.7 Guideline 7: "Take your baby to the clinic every month"

This guideline was well understood, accepted and implemented by the majority of participants. No recommendations were made by participants to adjust the message. However, this guideline is not directly food related, and was appropriately omitted from the revised PFBDGs as the new RtHB covers the aspects of immunisation and clinic visits.

5.4 RECOMMENDATIONS FOR FUTURE RESEARCH

The following recommendations are proposed for the testing and implementation of the revised PFBDGs:

- Further field testing is required amongst different socio-demographic groups in various geographical areas of South Africa. It was evident from the findings of this study and previous assessments of the PFBDGs that cultural and other socio-demographic circumstances affected the exposure to, and interpretation and application of, the guidelines. Well-tested and well-designed guidelines have the potential to effectively address our country's most pressing nutritional disorder.
- Educators, including health care staff at all levels, will require training and supportive documentation to ensure all educators convey consistent and clear messages.
- The PFBDGs will need to be translated into the various South African languages, as language barriers, especially amongst less educated groups, may lead to misunderstandings and misconceptions.
- Illustrations may be required in some populations to attract public attention and improve understanding of the guidelines. The development of a food guide to accompany the PFBDGs is therefore recommended.
- Some messages, especially those pertaining to the quality and the frequency of meals, may need to be adjusted for different socio-economic groups so as to consider food affordability and availability. These guidelines could also be delivered in conjunction with supportive community programmes, e.g. domestic food gardens, to overcome barriers of food unavailability and to improve the quality of the diet.
- The PFBDGs should be used in support of other community nutrition initiatives e.g. MBFI, the use of the RtHB and in particular in nutrition education and advocacy campaigns, to reinforce important messages and prevent inconsistent messages.
- A well designed and effective implementation and marketing programme will be required to ensure that the revised PFBDGs, once tested and adopted, reach all the communities in South Africa.
- Due to the developing nature of nutritional science, the PFBDGs will need to be monitored and adjusted continuously in terms of the process, outcomes, efficiency and impact of the guidelines.

5.5 LIMITATIONS OF THE STUDY

- The study protocol was composed during 2011 and 2012 and field work commenced prior to the release of the revised set of PFBDGs in 2013. Due to time and funding constraints, the study could not be postponed. The study consequently

aimed at assessing the dated version of the 2007 PFBDGs. Despite this limitation, the study results could still be used to evaluate the new 2013 version of the revised PFBDGs and to confirm the evidence-based approach used for the development thereof. The study results could further serve as a guide for the development of additional supportive educational material and a foundation for the future testing and adaptation of the revised PFBDGs.

- Qualitative studies have an inherent subjective nature, which, in the absence of standards or criteria with which to compare the results, renders validation of results difficult. A solution to this problem was nonetheless sought, by using predetermined probing questions to guide the discussions and by comparing results of this study to previous FBDG studies carried out among other cultural and socio-economic groups. Multiple investigators may have strengthened the design of the study by supplementing and contesting each other.
- It was originally planned to appoint independent health care workers to assist with the recruitment of participants, and interpretation and record keeping of FGDs, and one to undertake the role of a second observer during discussions. This would have allowed for an ideal triangulation technique where the combination of interviewing, observation and documentation could have enabled cross-data consistency checks. Unfortunately, due to financial and staff constraints, nobody was available for this role, and the investigator was forced to use the best possible methods (see Section 2.6.1.2) to improve the validity of qualitative data.

REFERENCES

1. Food and Agriculture Organization of the United Nations (FAO). World declaration and plan of action for nutrition. Rome: FAO/WHO International Conference on Nutrition, 1992.

2. Food and Agricultural Organization of the United Nations (FAO). State of food insecurity in the world. The multiple dimensions of food security. Rome: FAO, 2013.

3. United Nations Development Program (UNDP). Millennium Project. Commissioned by the UN Secretary General and supported by the UN development group. MDGs, 2002–2006. Available from: http://www.unmillenniumproject.org/goals/ [access 2006]

4. Chopra M, Daviaud E, Pattinson R, Fonn S, Lawn J E. Saving the lives of South Africa's mothers, babies and children: can the health system deliver? *Lancet* 2009; **374**: 835-846.

5. Chopra M, Lawn JE, Sanders D, et al. Achieving the health Millennium Development Goals for South Africa: challenges and priorities. *Lancet* 2009: **374**: 1023-1031.

6. World Health Organization (WHO). Preparation and use of food-based dietary guidelines. Report of a joint FAO/WHO Consultation. Technical Report Series No. 880. Geneva: WHO, 1998. pp 27-44.

7. Vorster HH, Badham JB, Venter CS. An introduction to the revised food-based dietary guidelines for South Africa. *S Afr J Clin Nutr* 2013; **26**(3, Suppl): S5-S12.

8. World Health Organization (WHO). WHO media centre. Noncommunicable diseases. 2014. Available from: http://www.who.int/mediacentre/factsheets/ [access 2013]

9. Vorster HH, Love P, Browne C. Development of food-based dietary guidelines for South Africa – the process. *S Afr J Clin Nutr* 2001; **13**(3, Suppl): S2-S6.

10. Bourne LT, Marais D, Love P. The process followed in the development of the paediatric food-based dietary guidelines for South Africa. *Matern Child Nutr* 2007; **3**: 239-250.

11. Murray S, Tredoux S, Viljoen L, Herselman MG, Marais D. Consumer testing of the preliminary paediatric food-based dietary guidelines (PFBDG) among mothers with infants younger than 6 months in selected urban and rural areas in the Western Cape. *S Afr J Clin Nutr* 2008; **21**(1): 34-38.

12. Scott LD, Marais D, Bourne L. Consumer testing of the preliminary paediatric food-based dietary guidelines for healthy children aged 1–7 years, among English- and Afrikaans-speaking mothers in the city of Cape Town, South Africa. *Publ Health Nutr* 2008; **12**(7): 979-985.

13. Van der Merwe J, Bourne L, Marais D. An assessment of preliminary food-based dietary guidelines for infants 6–12 months of age in the Little Karoo area of the Western Cape Province of South Africa. *Publ Health Nutr* 2007; **10**(9): 869-877.

14. Black RE, Victora CG, Walker SP, et al. Maternal and child nutrition 1. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; **382**: 427-451.

15. De Onis M, Blössner M. The World Health Organization global database on child growth and malnutrition: methodology and applications. *Int J Epidemiol* 2003; **32**: 518-526.

16. De Onis M, Frongillo EA, Blössner M. Is malnutrition declining? An analysis of changes in levels of child malnutrition since 1980. *Bull World Health Organ* 2000; **78**(10): 1222-1233.

17. De Onis M, Blössner M, Borghu E. Global prevalence and trends of overweight and obesity among preschool children. *Am J Clin Nutr* 2010; **92**: 1257-1264.

18. Dietz WH. Health consequences of obesity in youth: childhood predictors of adult disease. *Pediatrics* 1998; **101**(Suppl): 518-525.

19. Müller O, Krawinkel M. Malnutrition and health in developing countries. *CMAJ* 2005; **173**(3): 279-286.

20. Adams VJ, Markus MB, Adams JFA, et al. Paradoxical helminthiasis and giardiasis in Cape Town, South Africa: epidemiology and control. *African Health Sci* 2005; **5**(2): 131-136.

21. Crompton DWT, Montresor A, Nesheim MC, Savioli L. Controlling disease due to helminth infections. Geneva: WHO, 2003.

22. Victora CG, Adair L, Fall C, et al. Maternal and child undernutrition: consequences for adult health and human capital. *Lancet* 2008; **371**: 340-357.

23. Diaz JR, de las Cagigas A, Rodrígues R. Micronutrient deficiencies in developing and affluent countries. *Eur J Clin Nutr* 2003; **57**(Suppl 1): S70-S72.

24. Kennedy G, Nantel G, Shetty P. The scourge of “hidden hunger”: global dimensions of micronutrient deficiencies. *Food Nutr Agric* 2003; **32**:8-14. Available from: https://ew.uni-hohenheim.de/fileadmin/einrichtungen/nutrimatrix/Hidden_Hunger.pdf

25. King FS, Burges A. Nutrition for developing countries. 2nd ed. Oxford: Oxford University Press, 1996.

26. Corbett SS, Drewett RF. To what extent is failure to thrive in infancy associated with poorer cognitive skills? A review and meta-analysis. *J Child Psychol Psychiatry* 2004; **45**: 641-654.

27. Ziegler RG, Subar AF, Craft NE, Ursin G, Patterson BH, Graubard BI. Does β-carotene explain why reduced cancer risk is associated with vegetable and fruit intake? *Cancer Res* 1992; **52**(Suppl): 2060s-2066s.

28. Popkin BM. Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases. *Am J Clin Nutr* 2006; **84**: 289-298.

29. Must A, Strauss RS. Risks and consequences of childhood and adolescent obesity. *Int J Obesity* 1999; **23**(Suppl 2): S2-S11.

30. The South African Vitamin A Consultative Group (SAVACG). Anthropometric, vitamin A, iron and immunisation coverage status in children aged 6–71 months in South Africa, 1994. *S Afr Med J* 1996; **86**: 354-357.

31. Labadarios D, Steyn N, Maunder E, et al. The National Food Consumption Survey (NFCS): children aged 1–9 years, South Africa, 1999. *S Afr J Clin Nutr* 2001; **14**(2): 62-75.

32. Human Sciences Research Council (HSRC) & Medical Research Council (MRC). The South African National Health and Nutrition Examination Survey – SANHANES-1. Cape Town: HSRC Press, 2013.

33. Bradshaw D, Groenewald P, Laubsher R, et al. Initial burden of disease estimates for South Africa, 2000. Cape Town: South African Medical Research Council, 2003. Available from: http://www.mrc.ac.za/bod/initialbodestimates.pdf

34. Bourne LT, Hendricks MK, Marais D, Eley B. Addressing malnutrition in young children in South Africa. Setting the national context for paediatric food-based dietary guidelines. *Matern Child Nutr* 2007; **3**: 230-238.

35. Steyn NP, Labadarios D, Maunder E, Nel J, Lombard C. Secondary anthropometric data analysis of the National Food Consumption Survey: the double burden. *Nutrition* 2005; **21**: 4-13.

36. Iversen PO, Marais D, du Plessis L, Herselman M. Assessing nutrition intervention programmes that addressed malnutrition among young children in South Africa between 1994-2010. *AJFAND* 2012; **12**: 5928-5945.

37. Iversen PO, du Plessis L, Marais D. Nutritional health of young children in South Africa over the first 16 years of demogracy. *SAJCH* 2011; **5**(3):72-77.

38. Hendricks MK, Goeiman H, Dhansay A. Food-based dietary guidelines and nutrition interventions for children at primary healthcare facilities in South Africa. *Matern Child Nutr* 2007; **3**: 251-258.

39. United Nations International Children's Emergency Fund/World Health Organization. Conceptual framework for improved nutrition of children and women in developing countries. New York: UNICEF, 1990.

40. Department of Health (DOH), South Africa. Roadmap for Nutrition in South Africa 2013-2017. Pretoria: DOH, 2013

41. Dewey K. Guiding principles for complementary feeding of the breastfed child. Geneva: WHO Pan American Health Organization, 2001. pp 1-37.

42. Faber M, Oelofse A, Kriek JA, Spinnler Benade AJ. Breastfeeding and complementary feeding practices in a low socio-economic urban and a low socio-economic rural area. *S Afr J Food Sci Nutr* 1997; **9**(2): 43-51.

43. World Health Organization (WHO). Complementary feeding of young children in developing countries: a review of current scientific knowledge. Geneva: WHO, 1998. pp 167-178.

44. World Health Organization (WHO). WHO global database in childgrowth and malnutrition. The international reference population. 2014. Available from http://www.who.int/nutgrowthdb/about/introduction/en/index3.html [access 2014]

45. Love P, Maunder EMW, Green JM. Are South African women willing and able to apply the new food-based dietary guidelines? Lessons for nutrition educators. *S Afr J Clin Nutr* 2008; **21**(2): 17-24.

46. Keller I, Lang T. Food-based dietary guidelines and implementation: lessons from four countries – Chile, Germany, New Zealand and South Africa. *Public Health Nutr* 2007; **11**(8): 867-874.

47. Du Plessis LM, Pereira C. Commitment and capacity for the support of breastfeeding in South Africa: a paediatric food-based dietary guideline. *S Afr J Clin Nutr* 2013; **26**(3, Suppl): S120-S128.

48. Du Plessis LM, Kruger HS, Sweet L. Complementary feeding: a critical window of opportunity from six months onwards. *S Afr J Clin Nutr* 2013; **26**(3, Suppl): S129-S140.

49. Tomlinson M, Landman M. "It's not just about food": mother-infant interaction and the wider context of nutrition. *Matern Child Nutr* 2007; **3**: 292-302.

50. Lanigan JA, Bishop JA, Kimber AC, Morgan J. Systematic review concerning the age of introduction of complementary foods to the healthy full term infant. *Eur J Clin Nutr* 2001; **55**: 309-329.

51. Host A. Primary and secondary dietary prevention. *Pediatr Allergy Immunol* 2001; **12**(Suppl 14): 78-84.

52. Glinsmann WH, Bartholmey SJ, Coletta F. Dietary guidelines for infants: a timely reminder. *Nutr Rev* 1996; **54**: 50-57.

53. United NationsChildren's Emergency Fund. Programming guide: infant and young child feeding. New York: UNICEF, 2011. Available from: http://www.unicef.org/nutrition/files/Final_IYCF_programming_guide_2011.pdf

54. Van der Merwe J, Kluyts M, Bowley N, Marais D. Optimizing the introduction of complementary foods in the infant's diet: a unique challenge in developing countries. *Mater Child Nutr* 2007; **3**: 259-270.

55. Sibeko L, Dhansay MA, Charlton KE, Johns T, Gray-Donald K. Beliefs, attitudes, and practices of breastfeeding mothers from a periurban community in South Africa. *J Hum Lact* 2005; **21**(1): 31-38.

56. Faber M. Complementary foods consumed by 6–12-month-old rural infants in South Africa are inadequate in micronutrients. *Publ Health Nutr* 2005; **8**(4): 373-381.

57. Coulthard H, Harris G, Emmet P. Delayed introduction of lumpy foods to children during the complementary feeding period affects child's food acceptance and feeding at 7 years of age. *Matern Child Nutr* 2009; **5**(1): 75-85.

58. Harbron J, Booley S, Najaar B, Day CE. Responsive feeding: establishing healthy eating behaviour early on in life. *S Afr J Clin Nutr* 2013; **26**(3, Suppl): S141-S149.

59. World Health Organization (WHO). Global strategy for infant and young child feeding. Geneva: WHO, 2003. Available from: http://wholibdoc.who.int/publications/2003/9241562218.pdf

60. Meyer A, van der Spuy DA, du Plessis LM. The rationale for adopting current international breastfeeding guidelines in South Africa. *Mater Child Nutr* 2007; **3**: 271-280.

61. Kramer MS, Kakuma R. Optimal duration of exclusive breastfeeding. Cochrane Database of Systematic Reviews 2002, Issue 1. Art. No.: CD003517. DOI: 10.1002/14651858.CD003517

62. Butte NF, Lopez-Alarcon MG, Garza C. Nutrient adequacy of exclusive breastfeeding for the term infant during the first six months of life. Geneva: WHO, 2002.

63. Bourne L T, Pillime N, Samba M, Behr A. Food hygiene and sanitation in infants and young children: a paediatric food-based dietary guideline. *S Afr J Clin Nutr* 2013; **26**(3, Suppl): S156-S164.

64. Department of Health (DOH), South Africa. The Tshwane declaration of support for breastfeeding in South Africa. *S Afr J Clin Nutr* 2011; **24**(4): 214.

65. Pan American Health Organization (PAHO). The WHO golden rules for safe food preparation. World disaster reduction campaign, WHO 2008–2009. Available from: http://www.paho.org/english/dd/ped/te_gold.htm

66. World Health Organization (WHO). Regional Office for Europe. Water and Sanitation. The protocol on water and health: making a difference. 2006. Available from:

http://www.euro.who.int/__data/assets/pdf_file/0003/97833/WaterProtocol_2006upd_web.pdf [access 2006]

67. World Health Organization (WHO). Guiding principles for feeding non-breastfed children 6–24 months of age. Geneva: WHO, 2005. Available from: http//wholibdoc.who.int/publications/2005/9241593431.pdf

68. Trotter S. Cup feeding revisited. MIDIRS Midwifery Digest 2006; **16**(3):397-402. Available from: http://www.tipslimited.com/cupfeeding.htm

69. Statistics South Africa. Millennium Development Goals. Goal 4: Reduce child mortality. UNDP 2013. Available from: http://www.statssa.gov.za/nss/goal-reports/GOAL%204-REDUCE%2OCH.

70. Joubert G, Ehrlich R, Katzenellenbogen J, Karim SA. Epidemiology: a research manual for South Africa. 2nd ed. Cape Town: Oxford University Press, Southern Africa, 2007.

71. Patton, MQ. Qualitative research and evaluation methods. 3rd ed. California: Sage Publications, 2002.

72. Kitzinger J. Introducing focus groups. *BMJ* 1995; **311**(7000): 299-302.

73. City of Tshwane, Metropolitan Municipality. Department of Housing, City Planning and Environmental Management. Tshwane Metropolitan Profile. A compendium of planning information. 2009. Available from: http://www.tshwane.gov.za [access 2010]

74. Brand South Africa. The Languages of South Africa. Big Media Publishers. Available from: http://www.southafrica.info/about/people/language.htm#sepedi

75. Galery Ezakwantu. Central and Southern African Tribal Art; updated 2011 (cited 2002. Available from: http://www.ezakwantu.com/Tribes%20-%20North%20Sotho%20-%20Northern%20Basotho.htm

76. Coovadia H, Jewkes R, Barron P, Sanders D, McIntyre D. Health in South Africa 1. The health and health system of South Africa: historical roots of current public health challenges. *Lancet* 2009; **374**: 817-834.

77. Department of Health (DOH), South Africa. Health sites – HCT/MMC clinics. 2014. Available from: http://healthsites.org.za [access 2014]

78. Department of Health and Social Development, Gauteng Provincial Government. Tshwane/Metsweding Region 2010/2011. Primary health care facilities in Tshwane. March 2010.

79. SouthAfrica.info. The languages of South Africa. Available from: http://www.southafrica.info/about/people/langage.htm [2012, November 6]

80. Statistics South Africa. Community Survey 2007: Household Questionnaire (11/02/06). Available from: http://www.statssa.gov.za/community_new/content.asp?link=questionnaire.asp [access 2007]

81. Flick U, von Kardoff E, Steinke I. A companion to qualitative research. London: SAGE Publications Ltd, UK, 2004.

82. StatSoft Inc. STATISTICA (data analysis software system): version 12, 2014. Available from: www.statsoft.com

83. Malterud, K. Qualitative research: standards, challenges, and guidelines. *Lancet* 2001; **354**: 483-488.

84. Dierckx de Casterlé B, Gastmans C, Bryon E, Denier Y. QUAGOL: A guide for qualitative data analysis. *Int J Nurs Stud* 2012; **49**: 360-371.

85. Statistics South Africa. Census 2001. Investigations into appropriate definitions of urban and rural areas for South Africa. Discussion document, Report No. 03-02-20, 2001. Pretoria. Available from: http://www.statssa.gov.za/census01/html/UrbanRural.pdf

86. Organisation for Economic Cooperation and Development (OECD). OECD Better Life Index. Available from: www.oecdbetterlifeindex.org/topics/housing/

87. Statistics South Africa. Monthly earnings of South Africans, 2010. Statistical release P0211.2. Available from: www.statssa.gov.za/publications/P02112/P021122010.pdf

88. Merriam-Webster. An Encyclopedia Brittanica company. Springfield, Massachusetts: Merriam-Webster Inc, 2014. Available from: www.meriam-webster.com/dictionary

89. Coveney J. A qualitative study exploring socio-economic differences in parental lay knowledge of food and health: implications for public health nutrition. *Publ Health Nutr* 2004; **107**(5): 1138-1145.

90. Richter L, Griesel R. Malnutrition, low birth weight and related influences on psychological development. In: Dawes A and Donald D (eds). Childhood and adversity: Psychological perspectives from South African research. Cape Town: Oxford University Press, 1994.

91. Delport SD, Becker PJ, Bergh A. Growth, feeding practices and infections in black infants. *S Afr Med J* 1997; **87**(1): 57-61.

92. Doherty T, Chopra M, Nkonki L, Jackson D, Persson LA. Effect of the HIV epidemic on infant feeding in South Africa: "When they see me coming with the tins they laugh at me". *Bull World Health Organ* 2006; 84(2): 90-96. 2012. Available from: http://www.who.int/mediacentre/factsheets/fs290/en [2012]

93. Thomas B, Bishop J. Manual of Dietetic Practice. 4th ed. London: Wiley-Blackwell, UK, 2007.

94. Mhlanga, RE. Maternal, newborn and child health: 30 years on. In: Barron P and Roma-Reardon J (eds). South African health review 2008. Durban: Health Systems Trust [homepage on the Internet]. Available from: http://www.hst.org.za/publications/841

95. Sowden M, Marais D, Beukes R. Factors influencing high socio-economic class mothers decision regarding formula-feeding practices in the Cape Metropole. *S Afr J Clin Nutr* 2009; **22**(1): 37-44.

96. Mintz E, Reiff F, Tauxe R. Safe water treatment and storage in the home: a practical new strategy to prevent waterborne disease. *JAMA* 1995; **273**(12): 948-953.

97. Faber M, Benade AJS. Breastfeeding, complementary feeding and nutritional status of 6–12-month-old infants in rural KwaZulu-Natal. *S Afr J Clin Nutr* 2007; **20**(1): 16-24.

98. Marshall TA, Levy SM, Broffitt B, Eichenberger-Gilmore JM, Stumbo PJ. Patterns of beverage consumption during the transition stage of infant nutrition. *J Am Diet Assoc* 2003; **103**(10): 1350-1353.

ADDENDA

ADDENDUM 1: Informed consent form in English and Northern Sotho

Informed consent in English:

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

TITLE OF THE RESEARCH PROJECT:

An assessment of the comprehension of the South African preliminary paediatric food-based dietary guidelines for Northern Sotho infants 6–12 months of age in Soshanguve and Ga-Rankuwa.

PRINCIPAL INVESTIGATOR: Adeline Pretorius, Dietician, B Dietetics (UP)
CONTACT NUMBER: 071 369 7793

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Committee for Human Research at Stellenbosh University** and the City of Tshwane Municipality, Gauteng Provincial Government, Department of Health and Social Development. It will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research. Research funding is provided by the MRC.

What is this research all about?

- The study will be done in six selected health centre clinics in Soshanguve and Ga-Rankuwa. It is unknown exactly how many people will participate, but it is expected that one group discussions with 5-15 people per group will be held in each clinic to collect the necessary information.
- The study aims to assess the understanding and applicability of food-based dietary guidelines (FBDGs) developed in South Africa for healthy children 6-12 months of age among mothers and carers of Northern Sotho infants of this age group. The World Health Organisation (WHO) and the Food and Agricultural Organisation (FAO) recommended the development of local FBDGs and that field testing should be done among the general public prior to the release thereof. Previous studies have been undertaken in other parts of South Africa to assess FBDGs for the different age categories. However, there is a need to do such a study among Northern Sotho mothers/caregivers with infants aged 6-12 months, since they have not yet been explored.

- Mothers/carers with Northern Sotho infants attending baby clinics at the selected health centres at the time of the study will be given the opportunity to participate.
- Participants will be asked to complete a socio-demographic questionnaire (assistance for completion is available) that should take about 15 minutes. They will then be asked to participate in a group discussion with 4-14 other participants, a facilitator, a translator and an observer. The discussions will be held in a quiet room at the selected health centre clinics and should last about 60-90 minutes.
- The investigator will facilitate each discussion with the assistance of a Northern Sotho translator. A set of pre-determined questions will be used to guide the discussion.
- An observer will be present and take notes of what was said.
- The investigator will make a video-recording of the group discussion to use information for data-analysis.
- The focus of every discussion will be the proposed PFBDGs for children six to twelve months of age. A printed version of the proposed PFBDGs will be supplied in Northern Sotho.
- Refreshments consisting of tea, coffee, juice and biscuits will be provided at meetings.

Why have you been asked to participate?

- You are the mother/carer of a Northern Sotho infant between the age of six and twelve months attending one of the selected health centre clinics.

What will your responsibilities be?

- You will be asked to complete a questionnaire regarding your social background (assistance will be provided if necessary). You will then be asked to participate in a group discussion. Each discussion will be guided by a facilitator who will ask questions regarding the FBDGs. You, along with the other participants, will be asked how you understand and interpret each guideline. Each participant will be given an opportunity to participate in the discussion.

Will you benefit from taking part in the discussion?

- You may not benefit from this research project, however this study will assist in the future planning, funding and implementation of nutrition programmes within your community and municipality. In future, this may help mother/carers like yourself to feed their babies appropriately.

Are there risks involved in your taking part in this research?

- No, there are no risks involved.

Who will have access to the records of the discussions?

- The investigator will use the collected information only to meet the aim and objectives for this research project. All the information you provide will be held strictly confidential. No individual information will be identified and reported in the final written study. All collected information and data sheets will be kept by the investigator, will not be available to unauthorised individuals and will be destroyed on completion of the study.
- Research records may be inspected by the sponsors of the study, study monitors or auditors or Health Research Ethics Committee.

Will you be paid to take part in the study and are there any costs involved?

- No, you will not be paid to take part in this study and there will be no costs involved for you if you do take part.

Is there anything else that you should know or do?

- Further information on the research project can be obtained from the investigator.
- You can contact the Committee for Human Research 012-938 9207 if you have any concerns or complaints that have not been adequately addressed by your investigator.
- You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I …….. agree to take part in a research study entitled "An assessment of the comprehension of the South African preliminary paediatric food-based dietary guidelines for Northern Sotho infants 6–12 months of age in Soshanguve and Ga-Rankuwa".
I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the investigator feels it is in my best interest, or if I do not follow the study plan, as agreed to.

Signed at *(place)*…….. on *(date)*……...2012.

…….. ……

Signature of participant ***Signature of witness***

Declaration by investigator

I *(name)* …….. declare that:

- I explained the information in this document to ……..
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.
- I did/did not use an interpreter.

Signed at (*place)* …….. on *(date)* ……*2012*

…….. ……

Signature of investigator ***Signature of witness***

Declaration by Interpreter

I (*name)* …… declare that:

- I assisted the investigator (*name)* …….. to explain the information in this document to (*name of participant)*…….. using the language medium of Northern Sotho.
- We encouraged him/her to ask questions and took adequate time to answer them.
- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her questions satisfactorily answered.

Signed at (*place)* …… on *(date)*…….2012

…… ……

Signature of interpreter ***Signature of witness***

Informed consent in Northern Sotho:

LEINA LA PROTŠEKE YA DINYAKIŠIŠO:

Tekolo ya kwešišo ya Afrika Borwa ya methalohlahli ye e theilwego mo go dijo tša mathomo tša bana ba masea a Sesotho sa Leboa a dikgwedi tše 6-12 ka Soshanguve le Ga-Rankuwa.

MONYAKIŠIŠI MOGOLO: Adeline Pretorius, Dietician, B Dietetics (UP)
NOMORO YA GO IKOPANYA: 071 369 7793

O laletšwa go tšea karolo mo go protšeke ye ya dinyakišišo. O kgopelwa go tšea nako ya go bala tshedimošo yeo e tla go hlalošetšago ka botlalo ka ga protšeke ye. Botšiša bašomo ba thuto dipotšišo dife goba dife ka ga karolo efe goba efe ya protšeke ye o sa e kwešišego gabotse. Go bohlokwa kudu gore o kwešiše gabotse seo nyakišišo ye e lego ka ga sona le gore o ka tšea karolo bjang. Se ke thuto ya boithaopo. O lokologile go ka tšea sephetho sa go ka tšea karolo. Ge o re aowa, se se ka se go ame gampe felo. O lokologile gape go tlogela mo thutong nako ye nngwe le ye nngwe, le ge o dumetše go tšea karolo.

Thuto ye e dumeletšwe ke Komiti ya Dinyakišišo tša Batho ya Yunibesithi ya Stellenbosch le Mmasepala wa Toropo ya Tshwane, Kgoro ya tša Maphelo le Tlhabollo ya Leago. E tla swarwa go ya ka melawana le dintlha pono tša Pego ya Boditšhabatšhaba ya Helsinki, Methalohlahli ya Afrika Borwa ya Ditiro tša go Loka tša Ditekolo le Khansele ya Dinyakišišo tša Kalafi (MRC) le Methalohlahli ya Thuto ya Maitshwaro a Dinyakišišo.

- Go na le mekgatlo (Mokgatlo wa tša Maphelo wa Lefase le Mokgatlo wa Dijo le tša Temo) yeo e dirilego ditšhišinyo ka ga maemo a dijo (methalohlahli yeo e theilwego mo go dijo).
- Mekgatlo ye e šišintše go tšea maemo a go a dira gore a lokele dinaga tše di fapanego le ditšhaba.
- Dithuto tša go feta di dirilwe dikarolong tše dingwe tša Afrika Borwa to lekola ge e ba maemo dijo ao a tšerwego a Afrika Borwa (methalohlahli ye e theilwego mo go dijo) e kwešišwa le go lokela dihlopha tša selegae tša setšo tša mengwaga ye e fapanego.
- Thuto ye e tla thuša go bona ge e ba ditšhišinyo tša methalohlahli ye e theilwego mo go dijo ya Afrika Borwa ya bana ba ba phetšego gabotse (methalohlahli ye e theilwego mo go dijo tša bana tša mathomo (PFBDG)) di kwešišega bonolo le go šomišwa ke bomme/bahlokomedi ba bana ba Sesotho sa Leboa ba dikgwedi tše 6 go ya go 12.
- Ke bomme/bahlokomedi fela ba bana ba Sesotho sa Leboa ba dikgwedi tše 6 go ya go 12, bao ba yago dikliniking tša bana mo mafelong a a rilego a tša maphelo ka Soshanguve le Ga-Rankuwa ka nako ya thuto bao ba tla laletšwago go tšea karolo.
- Thuto e ka thuša go beakanya le go kaonafatša mananeo a dijo mo setšhabeng sa geno le mo mmasepaleng wa geno.

Baithaopi ba tla araba matlakalapotšišo ka ga maemo a bona a bophelo (bjk ntlo, mogolo bjbj) Se se tla tšea metsotso ye 15 (go tla ba le bathuši go le thuša go araba matlakalapotšišo). Ka morago ga fao

ba tla kgopelwa go tsenela dipoledišano tša sehlopha sa batho ba 4-14 ba bangwe. Dipoledišano di tla ba ka Sesotho sa Leboa ka phapošing mo kliniking ye ya tša maphelo gomme di tla tšea nako ya metsotso ye 60-90.

- Monyakišiši o tla eta pele dipoledišano ka thušo ya mofetoledi wa Sesotho sa Leboa.
- Molebeledi o tla be a le gona gomme a tšea dinoutsu tša seo se bolelwagod.
- Monyakišiši o tla dira video ya dipoledišano tša sehlopha go šomiša tshedimošo ge go dirwa pego ya thuto.
- Dipoledišano di tla ba ka ga ditšhišinyo tša diPFBDG tša bana ba dikgwedi tše 6 go fihla go 12. Phetolelo ye e gatišitšwego ya ditšhišinyo tša diPFBDG ka Sesotho sa Leboa e tla fiwa.
- Go tla fiwa tee, kofi, jusu/matute le dibiskiti mo dikopanong.

Tshedimošo ka moka ye e filwego ke ya poraefete. Ga go na motho yo a bolelwago mo go pego ya mafelelo. Tshedimošo ka moka le matlakala a direkhoto a tla bolokwa ke monyakišiši gomme a ka se be gona go batho ba bangwe gomme a tla senywa ge thuto e fela.

Tshedimošo ye nngwe ka ga protšeke ya dinyakišišo e ka hwetšwa go monyakišiši.

O ka ikopanya le Komiti ya Dinyakišišo tša Batho mo 021-938 9207 ge o na le dipotšišo dife goba dife goba dipelaleo tšeo monyakišiši wa gago a sa bolelago le wena ka tšona.

O tla hwetša khophi ya tshedimošo ye le foromo ya kwano.

Setatamente sa go tšea karolo

Ka go saena ka mo fase, nna …… Ke dumela go tšea karolo mo go thuto ya dinyakišišo ye e bitšwago “Tekolo ya kwešišo ya Afika Borwa ya methalohlahli ye e theilwego mo go dijo tša mathomo tša bana ba masea a Sesotho sa Leboa a dikgwedi tše 6-12 ka Soshanguve le Ga-Rankuwa”.
Ke tsebiša gore:

- Ke badile goba ba mpaletše tshedimošo ye le foromo ya kwano le gore e ngwadilwe ka leleme leo ke le tsebago kudu le go lokologa.
- Ke bile le sebaka sa go botšiša dipotšišo gomme dipotšišo tša ka ka moka di arabilwe gabotse.
- Ke kwešiša gore go tšea karolo mo go thuto ye ke **boithaopo** (ke kgetho ya ka go tšea karolo) gomme ga se ka gapeletšwa go tšea karolo.
- Nka kgetha go tlogela thuto nako ye nngwe le ye nngwe gomme nka se otlwe goba go swarwa ka mokgwa ofe goba ofe wo o sa lokago.
- Nka kgopelwa go tlogela thuto pele e fela, ge monyakišiši a bona seo go ba se se kaone mo go nna, goba ge ke sa latele peakanyo ya thuto, bjalo ka ge re kwane.

Tshaeno kua *(lefelo)*…….. ka *(letšatšikgwedi)*……...2013.

…….. ……

Tshaeno ka motšeakarolo ***Tshaeno ka hlatse***

Pego ka monyakišiši

Nna *(leina)* …….. tsebiša gore:

- Ke hlalošitše tshedimošo ka go tokomane ye go ……...
- Ke mo hlohleleditše go botšiša dipotšišo gomme ka tšea nako ye e lekanego go di araba.
- Ke kgotsofetše gore o nkwešišitše ka botlalo dikarolo ka moka tša nyakišišo bjalo ka ge di hlalošitšwe ka mo godimo.
- Ke/ga se ka šomiša mofetoledi.

Tshaeno kua (lefelo*) …….. ka (letšatšikgwedi) ……2013*

…….. ……..

Tshaeno ka monyakišiši ***Tshaeno ka hlatse***

Pego ka Mofetoledi

Nna (Leina*) …… tsebiša gore*:

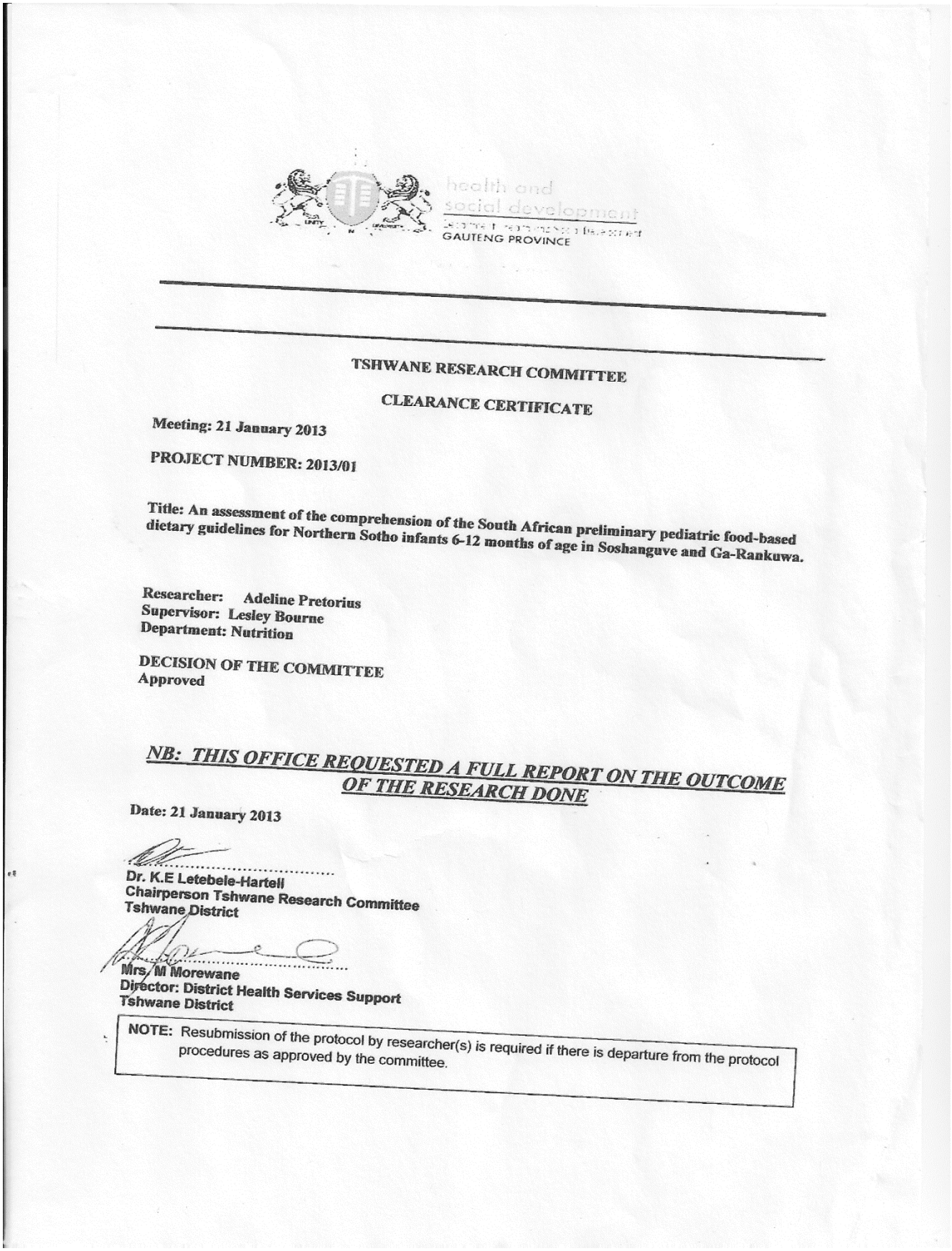
- Ke thušitše monyakišiši *(leina)* …….. go hlaloša tshedimošo ka go tokomane ye go (*leina la motšeakarolo)*…….. go šomišwa leleme la Sesotho sa Leboa.
- Re mo hlohleleditše go botšiša dipotšišo gomme ra tšea nako go di araba.
- Ke boletše phetolelo ye e swanago swaniswani le yeo ke e boditšwego.
- Ke kgotsofetše gore batšeakarolo ba kwešiša diteng tša tokomane ye ya tumelo ye e nago le tshedimošo gomme dipotšišo ka moka di arabilwe ka mo go kgotsofatšago.

Tshaeno kua (*lefelo)* …… ka *(letšatšikgwedi)*…….2013

…… ……

Tshaeno ka mofetoledi ***Tshaeno ka hlatse***

ADDENDUM 2: Permission letter from Tshwane Research Committee, Department of Health and Social Development



health and social development
GAUTENG PROVINCE

TSHWANE RESEARCH COMMITTEE

CLEARANCE CERTIFICATE

Meeting: 21 January 2013

PROJECT NUMBER: 2013/01

Title: An assessment of the comprehension of the South African preliminary pediatric food-based dietary guidelines for Northern Sotho infants 6-12 months of age in Soshanguve and Ga-Rankuwa.

Researcher: Adeline Pretorius
Supervisor: Lesley Bourne
Department: Nutrition

DECISION OF THE COMMITTEE
Approved

NB: THIS OFFICE REQUESTED A FULL REPORT ON THE OUTCOME OF THE RESEARCH DONE

Date: 21 January 2013

.....
Dr. K.E Letebele-Hartell
Chairperson Tshwane Research Committee
Tshwane District

.....
Mrs. M Morewane
Director: District Health Services Support
Tshwane District

NOTE: Resubmission of the protocol by researcher(s) is required if there is departure from the protocol procedures as approved by the committee.

ADDENDUM 3: Poster and leaflet

Poster and leaflet in English:

MOTHERS AND CARERS OF BABIES 6-12 MONTHS OLD

Are you the mother or carer of a Northern Sotho baby aged between 6 and 12 months in the Soshanguve or Ga-Rankuwa area?

YOU ARE INVITED TO PARTICIPATE IN A GROUP DISCUSSION ABOUT INFANT DIETARY GUIDELINES

AT (CLINIC) **ON** (DATE)

All mothers and carers with babies 6-12 months of age and attending one of the six selected primary health clinics in Soshanguve and Ga-Rankuwa are invited to participate in a research study. The study is supported by Stellenbosh University, City of Tshwane Municipality, Department of Health and Social Development and the Medical Research Council (MRC) and will assist in the future planning, funding and implementation of nutrition programmes within your community and municipality.
The aim of this study is to assess the comprehension and applicability of the South African preliminary paediatric food-based dietary guidelines (PFBDGs) for healthy infants 6-12 months old among mothers and carers taking care of Northern Sotho infants in this age group.
Participants meeting the inclusion criteria, will be asked to complete a socio-demographic questionnaire (assistance for completion is available) that should take about 15 minutes. They will then be asked to participate in a group discussion with 4-14 other participants, a facilitator, a translator and an observer. The discussions will be held in Northern Sotho a quiet room at the selected health centre clinics and should last about 60-90 minutes.

Your participation is **entirely voluntary** and you are free to decline to participate.

Refreshments consisting of tea, coffee, juice and biscuits will be provided at meetings.

For more details contact:
your health centre clinic or Adeline @ 071 369 7793

Poster and leaflet in Northern Sotho:

BOMME LE BAHLOKOMEDI
A RE KOPANENG KA
28 AY 9HOO

- A o mme goba mohlokomedi wa **ngwana** wa wa **dikgwedi tše 6 go fihla go 12**?

- A o bolela **Sesotho sa Leboa** ka lapeng la gago?

O LALETŠWA GO THUŠA MO GO THUTO KA GA MAEMO A DIJO TŠA BANA

Bomme le bahlokomedi ba bana ba dikgwedi tše 6-12 ba laletšwago tšea karolo mo go thuto ya nyakišišo. Thuto ye e thekgwa ke Yunibesithi ya Stellenbosch, Mmasepala wa Toropo ya Tshwane, Kgoro ya tša Maphelo le Tlhabollo ya Leago le Khansele ya Dinyakišišo tša Kalafi (MRC).

- Go na le mokgatlo wo o dirilego ditšhišinyo ka ga maemo a dijo lefase ka bophara.
- Thuto ye e tla thuša go bona ge e ba ditšhišinyo tše di kwešišega bonolo le go šomišwa ke bomme/bahlokomedi go bana ba dikgwedi tšeo.
- Thuto ye e ka thuša go beakanya le go kaonafatša mananeo a dijo mo setšhabeng sa geno le mmasepaleng wa geno.

Batho bao ba tsenelago thuto ba tla kgopelwa go araba dipotšišo ka ga maemo a bona a bophelo (bjk. Ntlo, mogolo bjbj). Se se tla tšea metsotso ye 15 (go tla ba le bathuši go le thuša go araba dipotšišo). Ka morago ga fao bat la kgopelwa go tsenella dikahlaahlo tša sehlopha sa batho ba 4-14 ba bangwe. Dikahlaahlo di tla ba ka Sesotho sa Leboa ka phapošing mo kliniking ye ya tša maphelo gomme di tla tšea nako ya metsotso ye 60-90.
Ke kgetho ya gago ge o nyaka go tsenela thuto.

- Go tla fiwa jusu/matute le dibiskiti mo dikopanong.

Go hwetša ditlhalošišo tše dingwe ikopanye le kliniki ya tša maphelo goba Adeline @ 071 369 7793

ADDENDUM 4: Socio-demographic questionnaire

An assessment of the comprehension of the South African preliminary paediatric food-based dietary guidelines for Northern Sotho infants, 6–12 months of age attending a health centre clinic in Soshanguve and/or Ga-Rankuwa.

SOSIO-DEMOGRAPHIC QUESTIONNAIRE

Research Study supported by the University of Stellenbosh

A community health care worker will read the following points to the potential participants and assist with the completion of the questionnaire if necessary:

1. Introduction of the health care worker to the parent/caretaker of the infant:

Introduce yourself with a formal greeting, preferably in Northern Sotho e.g.

Good morning/afternoon, my name is.....I am a health care worker who is employed in City of Tshwane Municipality, Department of Health and Social Development.

2. Purpose of the study

The purpose of the survey is to assess the comprehension and applicability of the South African preliminary paediatric food-based dietary guidelines (PFBDGs) for healthy infants 6-12 months old among mothers and carers taking care of Northern Sotho infants 6-12 months old. Mothers/carers with Northern Sotho infants between 6-12 months old, attending baby clinics at the selected health centres in Soshanguve and Ga-Rankuwa at the time of the study will be included.

The study was initiated by the World Health Organisation and supported by the Medical Research Council of South Africa and the University of Stellenbosch.

This will assist in the future planning, funding and implementation of nutrition programmes within your community and municipality.

Any information that is provided will be treated as confidential and used for research purposes only.

Questionnaires are available in English and Northern-Sotho.

Please ask the dedicated health care worker if you need assistance with the completion of the questionnaire?

For Office Use

Questionnaire completed by……..……

Date of completion…….....

Clinic where questionnaire was completed……

Identification number of the questionnaire……..

SECTION A: INCLUSION CRITERIA				Office Use
1	How old is the baby that you brought to clinic today?	Less than 6 months old		*Does the subject meet the inclusion criteria?* *Yes* ☐ *No* ☐ *O= North Sotho S = Sepedi T = Tswana*
		6-12 months old		
		More than 6 months old		
		Do not know		
2	What is the home language of the baby's mother? (Even if the mother passed away, what language did she speak?)	WRITE IN CAPITAL LETTERS IN THE BOX BELOW:		
SECTION B: PERSONAL BACKGROUND				
3	What is the name of the town or village where you live?	WRITE IN CAPITAL LETTERS IN THE BOX BELOW:		*S = Soshanguve G =Ga-Rankuwa O = Other*
4	What is your age in completed years?			
5	Are you male or female?	Male		*M*
		Female		*F*
6	What is your present marital status?	Married civil/religious		*M*
		Married traditional		*T*
		Polygamous marriage i.e. more than one wife/husband		*P*
		Living together as partners, but not married		*L*
		Never married		*N*
		Widow/widower		*W*
		Separated, but still married		*S*
		Divorced		*D*
7	How many children have you ever had that were born alive?			
8	What is your connection to the baby that you brought to clinic today?	Mother/Father		*P*
		Grandmother/Grandfather		*G*
		Great Grandmother/Great Grandfather		*GG*
		Aunt/Uncle (i.e. the sister/brother of the baby's mother or father)		*A*
		Sister/Brother		*S*
		Cousin		*C*
		Friend		*F*
		Other		*O*
SECTION C: EDUCATION				
9	What is the highest level of education that you have completed?	Enrolled in primary school, but never completed Grade 7/Standard 5		*1*
		Completed Primary School i.e. Grade 7/Standard 5		*2*
		Enrolled in high school, but never completed Grade 10/Standard 8		*3*
		Completed Grade 10/Standard 8		*4*
		Completed Grade 12/Matric		*5*
		Grade 12/Matric + post matric certificate/diploma		*6*
		Technicon degree		*7*
		University degree		*8*
		No schooling		*0*

SECTION D: EMPLOYMENT & OCCUPATION				
10	In the last 7 days, did any of the people in your household (including yourself) work for a wage, salary, commission or payment in any kind, even only one hour?	Yes		*Y*
		No (if your answer is "no", go to question X)		*N*
		Do not know (if your answer is "do not know", go to question X		*D*
11	If you answered "yes" in question 10, please list the occupation of each household member (including yourself) who work/worked for a wage, salary, commission or payment.	WRITE IN CAPITAL LETTER IN THE BOX BELOW:		*P= Piece job O=Operator T=Taxi driver S=Sales D=Design C=Cleaner F=Catering L=logistics Y=Security G=General*
12	Indicate the income category that best describes the gross monthly income of the household before deductions and including all sources of income.	No income		*0*
		Less than R1000		*1*
		R1 001 – R3 000		*2*
		R5 001 – R10 000		*3*
		R10 001 – R20 000		*4*
		More than R20 001		*5*
		Response not given		
		Do not know		
13	Are you able to provide a home and sufficient food for your household on the current household income?	Yes		***Y***
		No		*N*
SECTION E: HOUSING				
14	Which of the following best describes the main dwelling that your household occupies?	House/flat/town house or brick structure		*B*
		Traditional dwelling/hut/structure		*H*
		House/flat/room in a backyard		*R*
		Informal dwelling/shack		*S*
		Caravan/tent		*C*
		Workers' hostel		*WH*
		Other		*O*
15	How many rooms does your dwelling have (including kitchen, family room, bedroom etc)			
16	How many people, including yourself and the baby live in this dwelling?			
SECTION F: WATER & SANITATION				
17	In what way does your household obtain water for domestic use?	Piped water inside the dwelling		*PD*
		Piped water inside the yard		*PY*
		Piped water from access point outside the yard		*PO*
		Dam/pool		*D*
		River/stream		*R*
		Water vendor		*V*
		Other		*O*
18	What is the main type of toilet facility available for use by this household?	Flush toilet		*F*
		Pit toilet		*P*
		Chemical toilet		*C*
		Bucket toilet system		*B*
		None		*N*

SECTION G: ENERGY/FUEL					
19	What type of energy/fuel does your household mainly use for cooking?	Electricity			*E*
		Gas			*G*
		Paraffin			*P*
		Wood			*W*
		Coal			*C*
		Animal dung			*A*
		Solar			*S*
		Other			*O*
20	What type of energy/fuel does your household mainly use for lighting	Electricity			*E*
		Gas			*G*
		Paraffin			*P*
		Candles			*C*
		Solar			*S*
		Other			*O*
SECTION F: HOUSEHOLD GOODS					
21	Does your household have any of the following?	Refrigerator	No		*N*
			Yes		*Y*
		Radio	No		*N*
			Yes		*Y*
		Television	No		*N*
			Yes		*Y*
		Computer	No		*N*
			Yes		*Y*
		Landline telephone	No		*N*
			Yes		*Y*
		Internet facilities at home	No		*N*
			Yes		*Y*
		Post facilities (mail post box)	No		*N*
			Yes		*Y*
		Cell phone	No		*N*
			Yes		*Y*

How to complete the questionnaire?

For questions where a choice of answers is provided, mark the appropriate box next to the question with a cross e.g. [x]

For open-ended questions relating to place names, occupation, etc. write legibly in capital letters in the boxes provided below the question.

For example [TSHWANE]

What to use when completing this questionnaire?

Use only the pencil provided. If you make a mistake, use a soft rubber to erase the mistake and rewrite the correct answer.

THANK YOU FOR COMPLETING THE QUESTIONNAIRE

ADDENDUM 5: Probing questions and data capture sheet for FGDs

Clinic…… Date. …….. Name of facilitator…… Name of observer……..……Name of translator…..……		
Guideline 1. Enjoy time with your baby.		
Aim	**Probing Question**	**Observer notes regarding the discussion (only briefly), probing questions, body language and social processes.**
Exposure	**How (if you do) do you know about this guideline?**	
Interpretation	**What does it mean to enjoy time with your baby?**	
	How much time do you think one should spend with their baby?	
Cultural acceptability	**Considering the way you live (i.e. your cultural background, living conditions, economical status), in what way do you think this guideline is suitable/unsuitable for you, your baby and your family?**	
Practical application	**How do you spend time with your baby?**	
	How do you feel when you spend time with your baby?	
General	**In what way, if any, do you think this guideline needs to be changed?**	
Record any additional probes used specifically for this guideline.		

Guideline 2. From 6 months start giving your baby small amounts of solid foods (use models/pictures/hand size to determine food quantities)		
Aim	**Probing Question**	**Observer notes regarding the discussion (only briefly), probing questions, body language and social processes.**
Exposure	**How (if you do) do you know about this guideline?**	
Interpretation	**What do you consider small amounts of solid foods?**	
	What kind of solid foods (type and consistency) is suitable for a 6 month old baby?	
Cultural acceptability	**Considering the way you live (i.e. your cultural background, living conditions, economical status), in what way do you think this guideline is suitable/unsuitable for you, your baby and your family?**	
	What age do <u>you</u> think is best to start giving solid foods? **What are the reasons for your answer?**	
Practical application	**State the age of your baby and what solid foods (type and consistency) you currently give your baby.**	
	State the age of your baby and how much solid food (quantity) you currently give your baby.	
General	**In what way, if any, do you think this guideline needs to be changed?**	
Record any additional probes used specifically for this guideline.		

Guideline 3. Gradually increase your baby's meals to five times per day.		
Aim	**Probing Question**	**Observer notes regarding the discussion (only briefly), probing questions, body language and social processes.**
Exposure	**How (if you do) do you know about this guideline?**	
Interpretation	**How would you perceive "gradually" when increasing your baby's meal times?**	
	What does a "meal" consist of?	
	Participants may not consider snacks as a "meal". Probe for information to find out if any other food/drink apart from "meals" are given.	
Cultural acceptability	**Considering the way you live (i.e. your cultural background, living conditions, economical status), in what way do you think this guideline is suitable/unsuitable for you, your baby and your family?**	
Practical application	**How often do/did you feed your baby at:** - **6 months?** - **7-9 months** - **10-12 months**	
General	**In what way, if any, do you think this guideline needs to be changed?**	
Record any additional probes used specifically for this guideline.		

Guideline 4. Keep breast feeding your baby.		
Aim	**Probing Question**	**Observer notes regarding the discussion (only briefly), probing questions, body language and social processes.**
Exposure	**How (if you do) do you know about this guideline?**	
Interpretation	**What kind of milk is best for your baby between 6 and 12 months of age?**	
	Up to what age is breast milk advantageous?	
Cultural acceptability	**Considering the way you live (i.e. your cultural background, living conditions, economical status), in what way do you think this guideline is suitable/unsuitable for you, your baby and your family?**	
Practical application	**What kind of milk do you give your baby?** **Why did you decide to give this milk to your baby?**	
	If you don't breastfeed, up to what age (if you did at all) did you breastfeed your baby and why did you stop?	
	When do you plan (if you do) to stop breastfeeding your baby?	
General	**In what way, if any, do you think this guideline needs to be changed?**	
Record any additional probes used specifically for this guideline.		

Guideline 5. Offer your baby clean, safe water regularly.		
Aim	**Probing Question**	**Observer notes regarding the discussion (only briefly), probing questions, body language and social processes.**
Exposure	**How (if you do) do you know about this guideline?**	
Interpretation	**What do you perceive as regularly?**	
	What do you consider as being "clean" water?	
	What do you consider as being "safe" water?	
Cultural acceptability	**Considering the way you live (i.e. your cultural background, living conditions, economical status), in what way do you think this guideline is suitable/unsuitable for you, your baby and your family?**	
Practical application	**How often (if you do) do you give your baby water?**	
	What other drinks, apart from water and milk (if you do) do you give your baby and how often do you give these?	
	What kind of water do you give your baby? **(Probe to find out if boiled or bottled water is given)**	
General	**In what way, if any, do you think this guideline needs to be changed?**	
Record any additional probes used specifically for this guideline.		

Guideline 6. Teach your baby to drink from a cup.		
Aim	**Probing Question**	**Observer notes regarding the discussion (only briefly), probing questions, body language and social processes.**
Exposure	**How (if you do) do you know about this guideline?**	
Interpretation	**Describe the meaning of a "cup" for a baby?**	
Cultural acceptability	**Considering the way you live (i.e. your cultural background, living conditions, economical status), in what way do you think this guideline is suitable/unsuitable for you, your baby and your family?**	
Practical application	**When is your baby old enough to start drinking from a cup?**	
	What does your baby drink from at present?	
	How will you teach your baby to drink from a cup?	
General	**In what way, if any, do you think this guideline needs to be changed?**	
Record any additional probes used specifically for this guideline.		

Guideline 7. Take your baby to the clinic every month.		
Aim	**Probing Question**	**Observer notes regarding the discussion (only briefly), probing questions, body language and social processes.**
Exposure	**How (if you do) do you know about this guideline?**	
Interpretation	**Describe a suitable clinic where you can take your baby.**	
	Why do you think it's necessary to take your baby to the clinic?	
	How often do you think should you be taking your baby to the clinic	
Cultural acceptability	**Considering the way you live (i.e. your cultural background, living conditions, economical status), in what way do you think this guideline is suitable/unsuitable for you, your baby and your family?**	
Practical application	**To which clinic do you take your baby?**	
	How often do you take your baby there?	
	To what other (if any) clinic/doctor do you take your baby regularly? (Probe for information re attendance to hospital/ doctor/traditional healer etc.)	
General	**In what way, if any, do you think this guideline needs to be changed?**	
Record any additional probes used specifically for this guideline.		

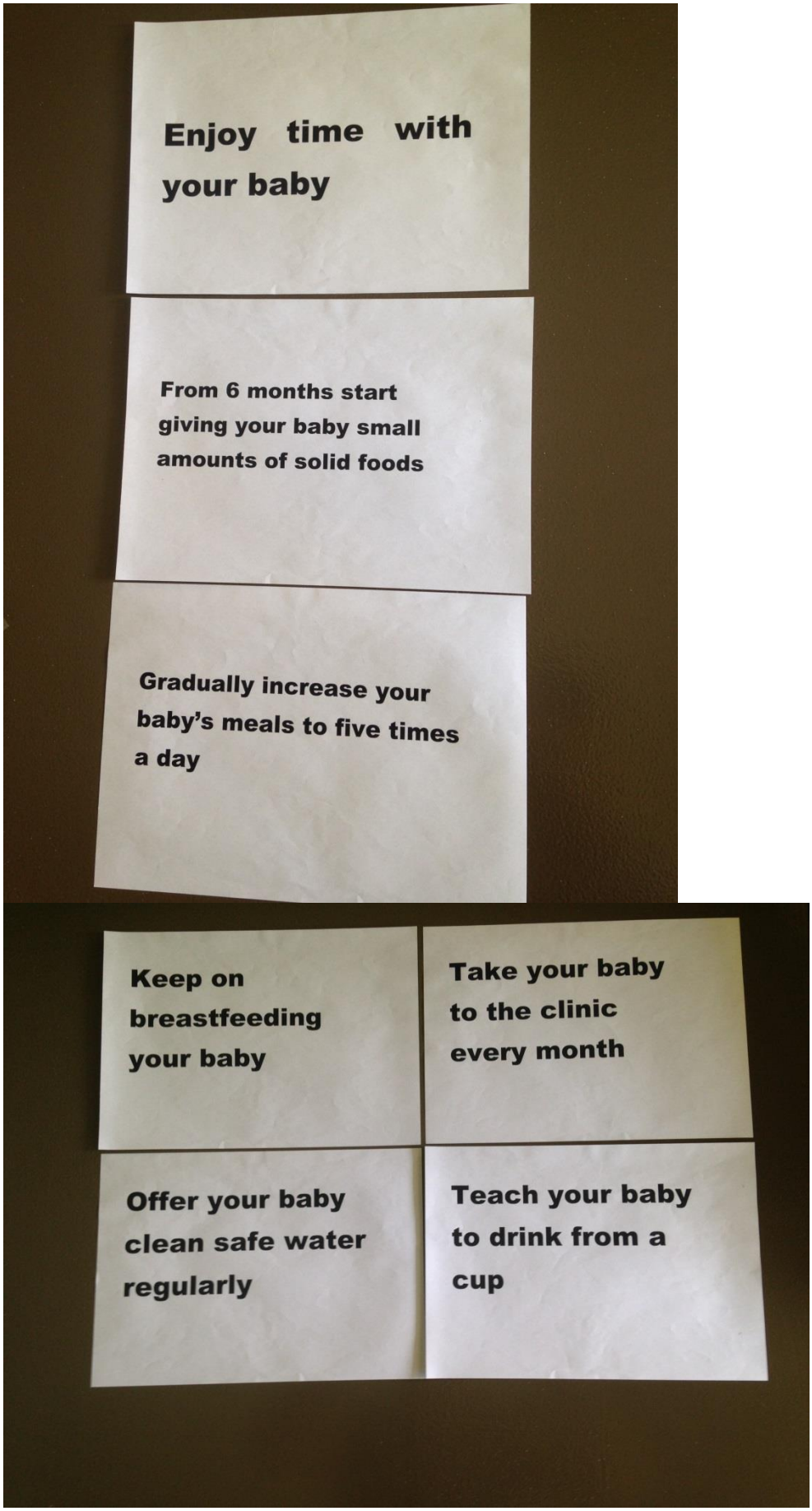
ADDENDUM 6: Guidelines for facilitating FGDs

The aim of the focus group discussions (FGD) is to obtain as much relevant information as possible regarding the comprehensibility i.e. exposure, interpretation, cultural acceptability and practical application of FBDG. Focus Groups should consist of 5-15 participants with a facilitator, a Northern Sotho translator and an observer.

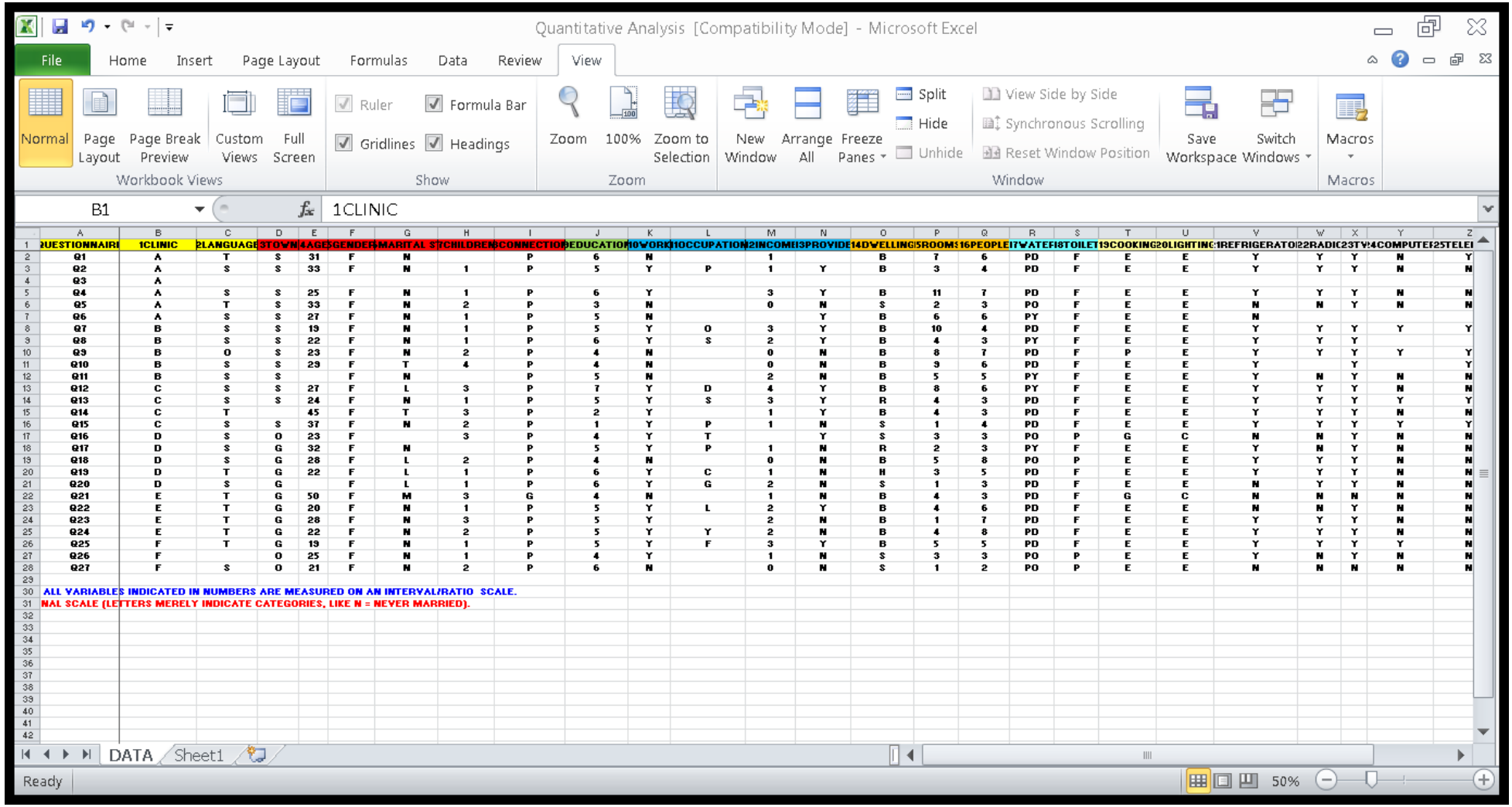
The process of the FGD and the role of the facilitator:

- Start the discussion with an introduction. Introduce yourself and allow participants to also introduce themselves.
- Provide an overview of the topic, reasons for the research project and that information will be treated with confidence.
- Read consent form out loud and ask participants to complete the consent form and socio-demographic questionnaire.
- Ask permission for the session to be video- and voice-recorded.
- Start video- and voice- recording.
- Lay ground rules i.e. allow each participant to give their opinion, respect each others' opinions, do not interrupt an individual when talking, remain focussed and discuss only what's relevant to the given topic.
- Use questions on the data capture sheet. Ask each question and use probes when necessary.
- Take notes of discussions and participants' body language and the movement of the discussion i.e. attitudes, feelings, etc. towards questions and guidelines throughout the duration of the FGD.
- Use the appropriate flash card when discussing a guideline.
- Use pictures/models to establish food portions.
- Remind the group to remain focused and bring the discussion back to the topic when necessary.
- Aim to limit the discussion to 60-90 minutes.
- At the end of the discussion thank everyone for their attendance and explain what will happen with the data.

ADDENDUM 7: Flash cards of guidelines used for FGDs



ADDENDUM 8: Microsoft Excel spreadsheet for capturing raw quantitative data



ADDENDUM 9: Qualitative data analysis with identified themes

QUALITATIVE ANALYSIS – THEMES

SOSHANGUVE

Guideline 1 – Enjoy time with your baby

Exposure

- At home
- At hospital (after birth)
- One respondent didn't hear, but reported that it's something she does "give the baby love"
- One clinic – nobody heard about this.

Interpretation

SPEND TIME WITH YOUR BABY

- Respondents seem to understand the concept, but focus on the "time" aspect – "spend time" means to enjoy.
    - "Spend time at home."
    - "Take time with your baby."
    - "Stay with your baby to get to know them better."
    - "Spend as much time as you can with your baby."
    - "Enjoy time with your baby".
- Baby fits in with daily routine, continue chores while spending time with the baby.

ADORE

- Spending time together allows the parent to get to know the baby, appreciate and adore their development.

CARING

Be attentive to the baby's needs. "Take time to see what the baby's doing. See what she likes or doesn't." "Watching". Bathing, washing, changing nappies.

PLAY WITH YOUR BABY

FEEDING/BREASTFEEDING

- Probing needed.
- Breastfeeding allows bonding.
- Feeding the baby

Enjoyment is focused on what the baby needs, how to care for the baby and keep them happy, not so much on what the mother enjoys.

How much time:

- "Most of the time"
- "There is no time" – most respondent agreed that there is no time limit, just as much as possible. "All day".
- Working mothers struggle with this – after work, weekends, but appear stressed and uncertain.
- "All the time"

Cultural acceptability

CONFIRMED

- Majority confirmed they can and acceptable.

INSUFFICIENT INCOME

- One reported insufficient income prevent them from buying everything, but still able to enjoy.
- Others reported that spending time doesn't involve any expenditure.

Practical application

How:

- Stay, play, laugh, sing, bath, feed, walk in the park, eat, be there for what the baby needs.

Being with the baby appears to be a mother's cultural obligation, only very little grandmothers attended – mainly mothers.

How do you feel when spending time with your baby:

- Happy, joy (one particular mother appeared to really enjoy time with the baby), good, feel a bond with the baby.
- Exhausting

General

Majority agreed no change needed.
Some wanted to elaborate – more expressive, "spend time" instead of "enjoy time".
Be with your baby – many parents don't spend time with their children.

Guideline 2 – From 6 months start giving your baby small amounts of solid foods

Exposure

All know about this.

- Clinic, nurse
- Hospital
- Home (from respondent's mother)
- Everywhere
- Day care
- Even during pregnancy
- Books, internet

Interpretation

Small amounts at 6 months =

- 1 teaspoon, 3 times per day (all agreed)
- 5 teaspoons, 6 teaspoons
- 1 respondent – using tablespoons at 6 months – but others disagreed as too much.
- 2 tablespoons

Kind of food suitable at 6 months =

- Lumpy texture
- Solid texture **–** child needs to eat well
- Smooth/mashed/soft - majority
- Little bit runny/smooth/thin **–** the baby was used to milk and need transition

Uncertainty and inconsistency exists around suitable textures and quantities for a 6 month old baby.

Cultural acceptability

Majority – Yes
One no – older generation (granny) believes in:

- Food and water to be given straight after birth
- Force feeding
- Herbal medicine – to "treat" the fontanel
- Water at an early age to prevent dehydration

Practical application

What age is the best to start introducing solid foods?

- **6 MONTHS** (majority reported 6 months)
  - Because the digestion system of the baby can now function well/receive solids.
  - Thin consistency as only starting with solids.
  - Still preparing the stomach to accept foods.
  - Juice, Purity from 6 months.

Confusion regarding the practical implementation of introducing solids around consistency and volume.
Some confusion around why starting at 6 months and what's appropriate.

- **ONLY BREAST MILK UP TO 6 MONTHS**

Even though participants reported to agree with the introduction of solids at 6 months, there is still uncertainty around weather this is the right time to start and left the investigator to wonder if solids were really introduced at 6 months by all of the participants.

How old is your baby, what food do you give and how much?
6 months

- Majority: Porridge mixed with formula milk (no expressed breast milk); 1 teaspoon, 3 times per day or commercial baby cereal st 1; some reported vegetables (pumpkin/squash); 6 teaspoons twice per day.
- Feed on demand
- Grandmother suggests when crying - ? overfeeding.

7 months

- Purity – "Cream of Maize"

8 months

- Soft porridge, no meat yet.

9 months

- Stage 2/3 purity, teething biscuits/ marshmallows for the gums.
- One respondent reported meat, but others frowned upon this.
- 3-4 tablespoons

10 months

- Purity – "Mabele" (mixed with formula milk and boiled water, no expressed breastmilk)
- Porridge with Rama margarine and water (no milk).
- ½ cup, 3-4 times per day; full cup.

1 year

- Styf pap, soup, vegetables, meat chicken (not fish as thought it was unsuitable)
- Butternut, mashed potato, "Mabele" mixed with formula milk.
- Full cup, 5-6 times per day.
- One respondent – everything that we eat as a family
- 3 meals per day
- 100ml at a time

2 respondents with 1 year old babies – one not giving meat, only commercialised cereal; one giving meat, soup, veg, but not fish; 1 respondent knows that a baby of this age needs meat, fish, veg etc. and seems knowledgeable.
All responds giving pap/porridge use formula milk made with boiled water, one uses water and margarine.
Only one giving meat before 1 year (at 10 months).
Not an overall good knowledge of what to give at what age. A lot of uncertainty and inconsistency regarding quantities, types and textures of food.
Purity is regarded as a reputable product, nobody considered home cooked food. Meat and proteins are not considered appropriate by all.

General

With probing suggested that measurements (spoons, cups) may be useful to explain "small" amounts.
Well understood, but if possible go to the clinic before starting with solids.
Everybody agreed that they understood the guideline and knew what solid foods meant – although practice didn't demonstrate this.
Only one respondent seemed to really comprehend this guideline.

Guideline 3 – Gradually increase your baby's meals to five times a day.

Exposure

- Clinic
- Hospital
- Two of three clinics – no exposure

Interpretation

"Gradually":

- As the baby grows
- Start with 3 meals per day and increase on demand – even for older babies, increase on demand.
- Increase every month as the baby gets older.

Adapt portions according to age. Concept well understood for some, but two clinics thought it wasn't very clear.

- One clinic – concept not understood. "Five times" appear to create a problem.

"Meal":

- Heavy food – Porridge, mashed potato, veggies, cereal, bread, pap & gravy.

- Snacks are different from meals –Smaller; Given after and between meals e.g. fruit, used to entertain a child, doesn't stay long in the stomach, drinks included.

One clinic – concept not understood, but reported a difference between a snack and a meal.

Cultural acceptability

- Lack of income - Many on child support grant and insufficient income to feed babies 5 times per day.
- One clinic – all agree it's acceptable.

Practical application

- 6 MONTHS - 3 times per day
- 7-9 MONTHS – 4 times per day, when needed
- 10 MONTHS – 5-6 times per day
- 12 MONTHS – 4 times or more

General

After probing:

- Feed on demand - Baby may not want 5 meals per day.
- Differentiate between snacks, meals and drinks.
- Specify number of snacks, meals and drinks.
- State the age and why needed at that age.
- What needs to be given (drinks and meals included.

Guideline 4 – Keep breastfeeding your baby.

Exposure

Everybody

- Clinic
- During pregnancy
- Everywhere
- On the street, neighbours
- Home (mother, granny, aunt, sister)
- Hospital

Interpretation

What milk is best:

- All agree on breast milk.

Up to what age?

- 2 years x 2
- "Individual choice"
- 6 years (other disagreed!)
- 6 months x 3
- 1 year x 1
- 18 months x 2
- 2 years x 2
- 5 years x 1

Everybody agrees that breastfeeding is best, but no consistency around when to discontinue breastfeeding, respondents agree and accept that it's an individual choice.

Cultural acceptability

- Culturally accepted as the norm – upon probing, only one understood that it may be a private ("they need privacy") issue for some people.
- Cost saving.
- Natural.
- Saves time – as no need to sterilise bottles.
- Breastfeeding prevents dehydration.
- Bottles can cause illness.
- Constraints – working mothers, can express.
- Breastmilk also seen as a "medicine" to protect the baby.

Practical application

- Majority breastfeed
- Formula - X 2 – working mothers, both mother breastfed initially (up to 4 months/until returning to work).
- Other participants feel that mothers returning to work can express.

Up to what age:

- 6 months x 1
- 1 year x 2
- 2 years x 3
- 18 months x 3
- 6 years

General

After probing – well understood and mother's decision when to stop breastfeeding.
One clinic feels need to state up to what age and state "always" breast feed.

Guideline 5 – Offer your baby clean, safe water regularly.

Exposure

Some didn't hear about this.
Majority:

- Home
- TV
- Clinic
- Great grand mother.
- Hospital
- Media – house-to-house campaigning, radio

Interpretation

Regularly:

- As much as possible, often
- Occasionally/sometimes, as alternative to/in between milk
- Now-and-then

How much water:

- A glass/ 2 glasses/ 2 bottles per day – varies and depend on the baby
- Very important to give, give with a spoon or sweeten to encourage

Clean water

- **Boiled** water
- **Closed** container
- Tap water (not boiled)

Safe water

- Mineral/bottled water
- Closed container
- **Boiled** water
- Tap, boiled water
- **Covered**

Participants don't seem to understand the difference between "safe" and "clean" – perceived as the same thing…"like we're saying".

Cultural acceptability

Yes.

Practical application

How often:

- As often as possible
- Depends on the season
- On demand, when thirsty
- 5-6 times per day

Other drinks:

- Majority – juice, rooibos tea; few times per week
- One reported juice can cause tooth decay, rinse with water

Kind of water given:

- Boiled (boiled tap water) - majority
- One reported with sugar and salt – after probing, only with diarrhoea
- Gripe water
- Still (bottled) water – not boiled

General

After probing –

- State "boiled" water - majority
- No need to state how often, as given on demand.
- State when
- From what age.

Guideline 6 – Teach your baby to drink from a cup

Exposure

- Home (parent/mom)
- Clinic
- Hospital
- News paper

Interpretation

Cup looks like:

- Sippy cup - closed cup with spout and handles – majority as small children can handle this and won't spill.
- Open cup – will need assistance.

Cultural acceptability

Acceptable

Practical application

Old enough:

- 6 months
- 7-8 months
- 8 months
- 12 months
- Although reported at 6 months, some still use a bottle at this age for water

What does baby drink from now?

- Bottle - majority
- Feeding cup

How will you teach:

- Demonstrated – head slightly tilted backwards and holding a cup.
- Holding the babies hands together around the handles and lifting to the mouth.
- Some will do it by themselves – automatically.
- Only one reported taught at hospital to do this.
- One reported hospital advised from birth for those who don't breastfeed

General

- Elaborate on "how" to do it.
- And after probing – "when" to start
- "When and how"

Guideline 7 – Take your baby to the clinic every month

Exposure

- All in the clinic
- Hospital
- Neighbours
- At home (parents)

Interpretation

Suitable clinic:

- Staff and how they treat the baby

- Sister available to check the baby
- Clean
- Any clinic
- Customer service
- Inform patients – e.g. posters

Necessary:

- Monitor growth and weight
- Immunisation
- Prevent illness/avoid infections
- When the baby is ill.
- Nurse's advice and expertise.

How often:

- Every month up to 1 year age, and when ill. (majority)
- Some (minority) – every 3 months from 6-12 months age.
- From 1 year every 6 months

Cultural acceptability

Acceptable and possible to take the baby every month.

Practical application

Which clinic:

- Local/any clinic near you

How often:

- On appointment – appointments given monthly (?)
- On wellness day

Even though everybody reported that they heard about this guideline, there seems to be an inconsistency and uncertainty regarding the practical application. The majority however appear to bring their babies to clinic every month.

Other clinics/doctors:

- Paediatrician
- To doctor when clinic is closed
- Pharmacy when clinic is closed

General

Clarification needed re up to what age.
One clinic – no need to change.

QUALITATIVE ANALYSIS - THEMES
GaRankuwa

Guideline 1 Enjoy time with your baby

Exposure
- Friends & Family
- Clinic & Hospital
- On the street
- Anywhere.
- One clinic – nobody heard about this before.

Obvious question

Interpretation
- CARING – care, nappy changes, exercises, look after, protect
- BOND – To hold, spend time, love, communicate, have fun, be happy, play.
- FEED – eat good food, vitamins

How much time:
- Anytime.
- Most of the time.
- All the time
- Waking hours – 12 hours.

No set time, as much as possible, whenever the opportunity arises, including caring hours.

Cultural acceptability
- Not a good time now - not working - can't afford; living with HIV
- No support - no husband, no boyfriend, no mother present.
- Not optimum enjoyment due to lack of income.
- Lack of knowledge (not knowing how to care for the baby) limits enjoyment.
- One respondent doesn't live with their baby due to work commitments – doesn't enjoy the fact of not being together.

This question needed a lot of probing/encouragement. Lack of support, lack of money, lack of knowledge seems to be a hindrance in enjoying time with a baby. Worry about what to do, food etc. One participant found it very distressing. Definite no from everybody, due to stress caused by unemployment.
Missing the point of "acceptability".
After probing – agreed that it's culturally acceptable and necessary.

Practical application

How to spend time:
- BEING with the baby all the time.
- SLEEPING with the baby.
- PLAYING
- TEACHING – to talk, walk
- FEEDING
- CARING - bathing

How do you feel when you spend time with your baby?
- Feel okay. Good, but not extremely happy.
- Happy and good.

In one clinic - nobody looks very happy. One participant very worried and uncertain, crying, doesn't feel equipped.
One clinic happy and content – positive body language.

General

Change guideline?
- I think it's perfect.
- It makes sense; well understood.
- Chang to "love your baby"; "more than anything"; "baby must be your first priority".

Guideline 2 From 6 months start giving your baby small amounts of solid foods.

Exposure.

Majority of participants heard about this.

- Health care facilities: At clinic, hospital, during pregnancy and after birth.
- Media: Radios, television.
- At home – parents, mother.

Interpretation

And what do you consider small amounts of solid foods (models displayed)?

- A teaspoon.
- 4 teaspoons once per day.
- 5 teaspoons, 6 times per day (disagreement as too much)
- 5 teaspoons, 3 times per day.
- 4 teaspoons every four hours.
- One tablespoon once per day.

And solid food, what is solid food?

- Porridge.

What kind of solid food is suitable for a baby at 6 months? (showing samples)

- 6 months – small (25ml portion), smooth. All agreed.

Cultural acceptability.

- One respondent - culture suggests starting with solids at the age of 3 months.
- Another respondent - some elders even suggest starting at 3 weeks (when baby cries, misinterpreted as being hungry), although the hospital suggests from 6 months.
- One respondent – when child gets hungry and breast milk insufficient, solids may be given from 1 month old.
- Using soft white porridge, as it is affordable.
- Some agree with 6 months.

Practical application

Introduced solids at:

- One x 5 days - cream of maize.
- One x 2 weeks – elders prefer, soft porridge 2 teaspoons 3 times per day, gradually increase.
- Two x 1 month – soft porridge.
- One x 6 weeks – baby received nourishment during pregnancy, therefore needs to continue afterwards.
- Two x 4 months – cream of maize with water.
- One x 2 months – Mabele. Because my mother said so. At 9 months, he's not eating, drinking the bottle only.
- One x 3 months.
- Four x 6 months, soft porridge/commercialised baby cereal.

One x force feeding: mother suggested closing the nostril and pushing food into the mouth with their hand. Respondent uses the hand to force the baby, but not closing the nostrils, as worried baby could die.
The respondent's mother suggested force feeding, even though the respondent did this, she was also aware that there was a risk of suffocation when closing the baby's nose.

My mum told me that if you don't give a baby food, she can't walk and she said I must give her food so that she can get busy and walk, that's the reason for giving food before recommended 6 months.

Even though all the respondents reported to have heard about this guideline, none of them actually introduced solids at 6 months, they all introduced solids well before 6 months.

What and how much food (using samples of food quantities incl. bowl, 250ml cup, tablespoon, teaspoon.)
6 months

- 4 teaspoons porridge once per day.
- Purity Cream of maize, 10 teaspoons twice per day mixed with water.

- Soft porridge, 3-4 teaspoons, twice per day.

7 months

- Nestum only.
- One bowl of porridge, twice a day
- 6 teaspoons Nestum twice per day (morning and evening). During the day water and occasional Marie biscuit.
- 3 meals per day – full bowl of food each for each meal.

8 months

- Pap, soup packet mixed with water. Vegetables. 3 meals per day, morning a cup of porridge, lunch Purity, evening a bowl of cooked food.

9 months

- 1 bowl three times per day, in the morning soft porridge and mash in the afternoon, at the night soft porridge, sometimes soup with meat.
- Pap with a packet of soup. Veggies e.g. spinach, pumpkin, mashed potato. Occ. baby juice, yoghurt (once/week). 3 meals per day – a cup of food for each meal.
- 5 teaspoons Nestum/Purity fruit, 3 times per day.

10 months

- Pap and gravy – gravy made with tomato and packet of oxtail soup. Also occ. Yoghurt, Purity, Baby cereal (Cerelac/Nestum). 3 meals per day, mornings cereal (Weet-Bix), lunch a bowl of cooked food, evening 1-1 ½ small tub yoghurt.

1 year

- A bowl 3 times a day. Porridge in the morning, soft pap with potatoes, soup, spinach, no meat. Probing for fruit or vegetables - No.

Probed a lot to find out if meat is given (all ages), but respondent reported only a packet of soup is used.

General

Do you think they have to change this?

- Majority - No.
- One respondent thought that the guideline should elaborate /explain small amounts

Respondents are aware of the guideline and has been told about this at their clinic, however cultural pressure at home caused them to introduce solids earlier. No one knew the reason for introducing solids only at 6 months.

Guideline 3 - Gradually increase your baby's meals to five times a day.

Exposure

No one.

Interpretation

Gradually:

- Step-by-step.
- Time-to-time.
- Ensure to increase.

Interpretation

Meal:

- Misinterpreted, one considered a "meal" as "mealie meal".
- Stamp, rice, mealie rice.
- Probing – majority: fruit or vegetables not regarded as a meal – a snack, such as eating a biscuit. A lighter option than a meal.

Majority of participants didn't understand the concept. Don't differentiate between "meals" and "snacks".
Only on participant perceived five meal as anything, incl. meals and snacks.
Differentiate between a meal and a snack. Respondents don't interpret a snack as a "meal".

Cultural acceptability

- Majority - Lack of income, therefore unaffordable to feed babies 5 times per day.
- One suggested planting to provide and increase food availability.
- No one seen others feeding their babies food five times per day.
- Two respondents – definite yes.
- Depends on the kind of meal – pap 5 times per day may be affordable, but not other foods.

An unfamiliar concept and the population don't seem to feed their babies this often, mainly due to financial constraints.

Practical application

6 months
- 1-2-3 times per day.

7-9 months
- Majority 3 times per day.
- 3-4 times per day
- Only 2 meals per day as nurse said baby was overweight.

10-12 months
- 3-4 times
- 4 times, 3 meals and a snack.
- 3 times, but increase the amount of food that's given.

Participants do not know how often and how much to feed their babies. There appear to be a lot of inconsistency and uncertainty. Some may have reported that they fed their babies only three times per day, but their babies were eating mid-morning during the FGD – maybe due to differentiation off meals vs snacks.

General

- Two groups reported no change is needed.
- How much food to give five times per day.
- Another group suggested changing the guideline to include at what age 5 meals are needed and what kind of meals should be given.

No one giving five meals per day, as they don't have enough food and insufficient grant and unaware/misinterpreation of the guideline.

Guideline 4 - Keep on breastfeeding your baby.

Exposure

All - definite "yes".
- Health care facility – clinic, hospital.
- Home.
- Media - radios, television.
- In the taxis.

Interpretation

What milk is best:
Breast feeding.
One respondent reported that circumstances may prevent the mother from breastfeeding e.g. work etc.
Formula regarded as a replacement of breast milk if the mother can't breast feed.
Respondents needed probing to consider "keep on" – i.e. during sickness etc. None of them considered/addressed this.

Cultural acceptability

- Definite yes - Culturally accepted.
- The only affordable milk.

Practical application

What kind of milk given:
- Majority of respondents are breastfeeding.
- Some using breastfeeding and using Nan in porridge.
- Two respondent not breastfeeding
  - HIV positive. Giving Nan to 12 month old baby, but not the full strength to save money.
  - Slimming too much, giving Nan Pelargon – breastfed up to 3 months.
- One respondent attended with grandchild. Baby was breastfed up to 6 months, when mother started working and formula was introduced.
- One respondent breastfed for 2 weeks before introducing Lactogen via a bottle, because the baby refused to be breastfed.

Planning to stop breastfeeding:

- When I get a job.
- 6 months (x 2)
- Stopped at 6 months (x1) – post-op and baby kicked the wound during feeding)
- 18 months (x 2).
- One year (x 3).
- Two years (x 2).
- 3 years (x 1)

Respondents accept this as a personal choice.

General

No one suggested any changes, confusion exist around when to stop breastfeeding.
Could add advice re when to stop.

Guideline 5 - Offer your baby clean, safe water regularly.

Exposure

Some didn't hear about this, but majority did.
Others:

- Health care facility – hospital and clinic.
- At home.
- Home-based care. (Someone who comes goes door-to-door for home visits.)
- Magazines.
- Clinic card.

Interpretation

Regularly:

- Every day, always.
- After every meal.
- Some participants appear confused.

Clean water:

- One clinic:
    - Cleaned container
    - Running water
    - Purified with Jik (1 teaspoon/5 litre water), but never had to, as water is normally clean.
- Two clinics – boiled water.

Safe water:

- Running water is safe.
- Boiled water (probing needed – only one respondents seems to boil tap water).
- Tap water; no need to boil (probed)
- Pure water – from the tap and no need to boil.
- Bottled water – unaffordable (probed)
- Closed after boiling x 2.
- Tap boiled water.
- Only one clinic – definitely boiled water.

Only at one clinic boiled water was definitely suggested. For the other two clinics, boiled water was not an obvious answer. At one clinic only one respondent reported boiled water. At the other clinic probing was needed before boiled water was reported.

Cultural acceptability

- Majority - Yes – affordable and available.
- One respondent didn't have electricity and needs to heat paraffin stove to boil water. Questionable if this was done all the time, although she reported she did.

Practical application

How:

- Via a teaspoon.

Where do get water from:

- A tap.

- Boiled tap water.

How often:

- Twice per day (x 3)
- Anytime x 2.
- More times.
- After a meal.
- On demand – when asking for water.

Respondents aware that babies need water regularly.

Other drinks:

- A lot give juice – once per week.
- Others only milk and water.
- Some give Rooibos sometimes – 2-3 times per week. One respondent once/day.
- Bottled water (e.g. when out shopping) and not boiled.
- One – water with sugar.

Some participants seem totally unaware that any water needs to be boiled or doesn't regard this as important.

General

- Majority - no change needed.
- One respondent reported that education is needed so that everybody knows/aware of this.

Respondents aware that water needs boiling, but a lot of probing needed to get to this. Not all seem to boil water first, only a couple reported to be doing it.

Guideline 6 - Teach your baby to drink from a cup.

Exposure

- None.
- Mainly confusion
- A few – yes – Clinic and hospital.

Interpretation

What does it mean to drink from a cup?

- To use the cup to drink.

What kind of cup:

- Majority – a cup with two handles.

And a cup like this (showing beaker)?

- The baby can't hold it.
- One participant using an open cup, a few agreed that it was suitable.

If you hold it, will the baby be able to drink from this?

- Yes. Baby can use an open cup if assistance is provided.

Only one or two look like they're using a cup.

Cultural acceptability

Yes.

But not many seems to be doing it.

Practical application

When is baby old enough to drink from a cup?

- When she walks.
- When they start on solid foods (x 1)
- 18 months.
- Two years old.
- 8 months

Currenly using:

- Mother's hand.
- Majority - Bottle.
- Teaspoon
- Sometimes a cup sometimes, but disliked. Only a few reported to be using a cup sometimes.
- Few using an open cup.
- One using a closed cup with handles.

How will you teach your baby to drink from a cup?

- Pour water and show them how to hold.
- Hand it to the baby/just give it to the child – they will know how to hold.

Even though some participants agreed that a baby can drink from a cup, bottles are mainly used. Majority don't seem to be aware of this guideline, why it should be introduced and how to put this into practice.

General

Any changes needed:

- Majority - No.
- After probing – How and when.
- Need to elaborate on what age to introduce a cup and what kind of cup.

Guideline 7

Take your baby to the clinic every month.

- It makes sense.

Exposure

Did you hear about this before?

- All respondents have heard about this.

And where did you hear that?

- Clinic.
- Hospital.

Interpretation

Why is it important?

- Majority - Monitor growth – check weight and height.
- Prevent illness.
- For advice – how to feed etc.

What is a suitable clinic?

- Local.
- Clean
- Any clinic
- Safe
- Informative with posters
- Nurses (experts) to assist.
- Not waiting long (currently waiting about 2-3/5 hours)

How often do you think you should take your baby to the clinic?

- Every month.
- Or anytime when the baby was sick.

All seems to agree on monthly visits and are actually doing it.

Cultural acceptability

Is it possible for you, to come to the clinic every month (considering time and money)?

- Yes.
- I walk to the clinic, it takes me 30 minutes.
- One respondent reported living far from the clinic and needs to take a taxi. Lack of income could jeopardise the treatment of a child. To take a baby every month, they use their own healers.
- One respondent – elders don't think it's necessary

Practical application

And to which clinic do you take your baby?

- Local/nearest.

And how often do you actually take your baby?

- Every month – everybody agrees.
- When I see anything unusual to my baby, I come to the clinic.

Everyone brings their baby every month, and in between when the baby is ill. A clinic card is provided with a monthly appointment date.

And then, do you take your baby anywhere else, except for the clinic?

- No.

- Medicine is sometimes bought from the chemist when a baby is ill.
- Doctor.
- Hospital.

General

- Everyone agrees no change is needed and guideline well understood.
- One clinic – why baby should be taken (what reason, e.g. immunisation) and up to what age monthly visits are needed.

ADDENDUM 10: Approval letter from Ethics Committee

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jou kennisvennoot · your knowledge partner

Approval Notice
New Application

19-Oct-2012
PRETORIUS, Adeline

Ethics Reference #: S12/02/057

Title: **An assessment of the comprehension of the South African preliminary paediatric food-based dietary guidelines for Northern Sotho infants 6-12 months of age in Soshanguve and Ga-Rankuwa**

Dear Mrs Adeline PRETORIUS,

The New Application received on 23-Feb-2012, was reviewed by staff members of the HREC office on 29-Feb-2012 and was approved.
Please note the following information about your approved research protocol:

Protocol Approval Period: 15-Oct-2012 -15-Oct-2013

Please remember to use your protocol number (S12/02/057) on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review:
Please note a template of the progress report is obtainable on www.sun.ac.za/rds and should be submitted to the Committee before the year has expired.
The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.
Translation of the consent document to the language applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372
Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health (healthres@pgwc.gov.za Tel: +27 21 483 9907) and Dr Helene Visser at City Health (Helene.Visser@capetown.gov.za Tel: +27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.
For standard HREC forms and documents please visit: www.sun.ac.za/rds

If you have any questions or need further assistance, please contact the HREC office at 0219389207.

Included Documents:
Investigators declaration
Synopsis
Application form
Checklist
Protocol

Sincerely,

Mertrude Davids
HREC Coordinator
Health Research Ethics Committee 2

ADDENDUM 11: Amended approval letter from Ethics Committee

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jou kennisvennoot · your knowledge partner

Ethics Letter

03-Jul-2013

Ethics Reference #: S12/02/057
Title: An assessment of the comprehension of the South African preliminary paediatric food-based dietary guidelines for Northern Sotho infants 6-12 months of age in Soshanguve and Ga-Rankuwa

Dear Mrs Adeline PRETORIUS,

Your letter dated 29 May 2013 refers.

The Chairperson of the Health Research Ethics Committee approved the amended documentation in accordance with the authority given to him by the Committee.

The following amendments were approved:
Instead of 2 dedicated health care assistants, a different HCW will assist at each clinic after brief training by the facilitator.

If you have any queries or need further help, please contact the REC Office 0219389207.

Sincerely,

REC Coordinator
Mertrude Davids
Health Research Ethics Committee 2